



## Arlington Conservation Commission

**Date:** Thursday, May 5, 2022

**Time:** 7:00 PM

**Location:** Conducted by Remote Participation

Pursuant to State Legislation suspending certain provisions of the Open Meeting Law, G. L. c. 30A, § 20 relating to the COVID-19 emergency, the May 5, 2022, public meeting of the Arlington Conservation Commission shall be physically closed to the public to avoid group congregation. The meeting shall instead be held virtually using Zoom. Please register in advance for this meeting. Reference materials, instructions, and access information for this specific meeting will be available 48 hours prior to the meeting on the Commission's agenda and minutes page.

### Agenda

1. Administrative
  - a. Park & Recreation Commission Update  
C. Garnett will provide an update on her work as liaison to the Park & Recreation Commission.
  - b. Updates to Regulations  
S. Chapnick will present a draft of the updated and revised Arlington wetlands regulations.

### 2. Hearings

#### **Request for Determination of Applicability: 20 Lafayette**

Request for Determination of Applicability: 20 Lafayette

This public hearing will consider a Request for Determination of Applicability for a partial demolition, addition, and renovations to the existing residential structure at 20/20A Lafayette Street. Work is proposed within the floodplain (FEMA Zones AE, X) of Alewife Brook.

#### **Notice of Intent: 34 Dudley Street**

Notice of Intent: 34 Dudley Street

*This application was first heard on March 3, 2022. The hearing was continued at the applicant's request. The commission requested the applicant to update documents related to photometrics, shading, erosion controls, and stormwater management. For the original application, please refer to the March 3, 2022 meeting materials; no additional materials were provided for the May 5, 2022 hearing.*

This public hearing will consider a Notice of Intent to construct a five-story self-storage facility at 34 Dudley Street and remove a failing retaining wall on the adjacent Town-owned parcel at 0 Grove Street. As proposed, the project will result in impacts within the Riverfront Area to Mill Brook, 100-foot Adjacent Upland Resource Area, and buffer zone to Bank.



## **Town of Arlington, Massachusetts**

---

### **Park & Recreation Commission Update**

#### **Summary:**

Park & Recreation Commission Update

C. Garnett will provide an update on her work as liaison to the Park & Recreation Commission.



## **Town of Arlington, Massachusetts**

---

### **Updates to Regulations**

#### **Summary:**

Updates to Regulations

S. Chapnick will present a draft of the updated and revised Arlington wetlands regulations.



## Town of Arlington, Massachusetts

---

### Request for Determination of Applicability: 20 Lafayette

#### Summary:

Request for Determination of Applicability: 20 Lafayette

This public hearing will consider a Request for Determination of Applicability for a partial demolition, addition, and renovations to the existing residential structure at 20/20A Lafayette Street. Work is proposed within the floodplain (FEMA Zones AE, X) of Alewife Brook.

#### ATTACHMENTS:

	Type	File Name	Description
▢	Reference Material	20_Lafayette_Street_RDA_Package.pdf	20 Lafayette Street RDA Package

**EcoTec, Inc.**  
**ENVIRONMENTAL CONSULTING SERVICES**  
102 Grove Street  
Worcester, MA 01605-2629  
508-752-9666 – Fax: 508-752-9494

By Email and By Hand

April 1, 2022

Arlington Conservation Commission  
Arlington Town Hall  
730 Massachusetts Avenue  
Arlington, MA 02476

RE:    -Request for Determination of Applicability under the Massachusetts Wetlands Protection Act and Arlington Wetlands Protection Bylaw  
          -Jurisdictional Determination associated with Proposed Addition to Residential Structure and Associated Site Activities, 20-20A Lafayette Street, Arlington, Massachusetts  
          -Applicant: North America Development LLC

To the Commission:

Enclosed please find the requested number of copies of the Request for Determination of Applicability (RDA) filed under the Massachusetts Wetlands Protection Act and the Arlington Wetlands Protection Bylaw. There is no filing fee for an RDA under the Act; enclosed, please find a check in the amount of \$150.00 made payable to the Town of Arlington for the filing fee under the Bylaw. There is no requirement for abutter notification for an RDA under the Act; as noted below, abutters within 100 feet of the subject site require notification via regular, first-class mail under the Bylaw.

**Please have the legal notice billed to EcoTec, Inc. (508-752-9666 ext. 3). The required Legal Notice Charge Authorization form is included as part of the Request.**

The Applicant is seeking a Negative Determination 4 under the Act and a Negative Determination 6 under the Bylaw as the subject site is located and the proposed work occurs outside geographical jurisdiction under the Act and Bylaw.

**Submitted Materials:**

This submittal consists of the following:

1. This Cover Letter, which includes the Wetland Resource Evaluation and Project Description and Analysis;
  - a. Town of Arlington GIS Map with site indicated;
  - b. USGS Topographic Map, Boston North Quadrangle, dated 1985 with the site indicated;
  - c. Flood Insurance Rate Map (Dynamic FIRMette), Map Number 25017C0419, Effective Date June 4, 2010, with the site indicated;
  - d. Letter of Map Revision, Case No.: 15-01-2142P, Effective Date April 8, 2016;
  - e. Massachusetts NHESP Atlas, 15<sup>th</sup> Edition, effective August 1, 2021 showing Estimated Habitat, Priority Habitat, and Certified and Potential Vernal Pools, with the site indicated;
  - f. Resume; and
2. Request for Determination of Applicability Form (WPA Form 1)
3. Bylaw Filing Fees and Transmittal Form with Redacted Copy of Bylaw Filing Fee Check;
4. Legal Notice Charge Authorization Form;
5. Abutter List Cover Letter, 100-foot Abutters List, Abutter Map, Abutter Notification, and Affidavit of Service;
6. "Stormwater Report, 20-20A Lafayette St., Arlington, MA," prepared by Spruhan Engineering PC, Signed and Stamped by Edmond T. Spruhan, PE; and
7. Site Plan:
  - a. "Existing Conditions, 20-20A Lafayette Street, Arlington, Massachusetts," Sheet 1 of 1, Scale: 1" = 10', prepared by Peter Nolan & Associates LLC, dated May 11, 2021, Signed and Stamped by Peter J. Nolan, PLS;
  - b. "Civil Plan, 20-20A Lafayette St., Arlington, Massachusetts," Sheet 1 of 3, Scale: 1" = 10', prepared by Peter Nolan & Associates LLC and Spruhan Engineering P.C., dated March 30, 2022, Signed and Stamped by Peter J. Nolan, PLS and Edmond T. Spruhan, PE;
  - c. "Details, 20-20A Lafayette St., Arlington, Massachusetts," Sheet 2 of 3, Scale: Not to Scale, prepared by Peter Nolan & Associates LLC and Spruhan Engineering P.C., dated March 30, 2022, Signed and Stamped by Edmond T. Spruhan, PE; and
  - d. "Erosion Control & Demolition Plan, 20-20A Lafayette St., Arlington, Massachusetts," Sheet 3 of 3, Scale: 1" = 10', prepared by Peter Nolan & Associates LLC and Spruhan Engineering P.C., dated March 30, 2022, Signed and Stamped by Edmond T. Spruhan, PE.

One copy of this submittal has been sent certified mail, return receipt requested to MassDEP-NERO. Again, there is no filing fee for an RDA under the Act.

There is no requirement for abutter notification for an RDA under the Act. Notification of abutters by regular, first-class mail is required for an RDA under the Bylaw. The Abutter List

Cover Letter, Abutter List, Abutter Map, Abutter Notification, and Affidavit of Service indicating that the Abutter Notifications have been mailed is included as part of this submittal.

### **Wetland Resource Evaluation:**

On March 14, 2022, EcoTec, Inc. inspected the above-referenced property and the areas within 200 feet of the site for the presence of wetland resources as defined by: (1) the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131, S. 40; the “Act”) and its implementing regulations (310 CMR 10.00 *et seq.*); and (2) the Town of Arlington Wetlands Protection Bylaw (Article 8) and the Arlington Regulations for Wetlands Protection (March 1, 2018). John P. Rockwood, Ph.D., SPWS conducted the inspection.

Existing Conditions: The subject site consists of a 0.108±-acre (4,689.7± square foot) parcel located to the southeast of Lafayette Street in Arlington, Massachusetts (see attached Town of Arlington GIS Map). The site is entirely developed with a residential structure; two paved driveways; front walkway with landing and steps; side and rear walkway; side and rear landings with steps; wooden fencing near the eastern, southern, and western property boundaries; and associated lawn and landscaping (see Existing Conditions Plan). An eastern white pine stump was observed in the northern portion of the site; a Norway maple tree occurs in the southwestern portion of the site; and several trees, including Norway maple, silver maple, and red maple, occur off-site to the south near the southern property line.

A Building Permit was pulled by the Applicant on December 3, 2021 and work on the property began in December 2021. On February 7, 2022, the Director of Inspectional Services, Michael Ciampa, indicated that the property is in an area under the jurisdiction of the Conservation Commission and all work was to cease until authorization from the Conservation Commission was received. Work on the site was stopped at that time. During the time work occurred, a pine tree and landscaping in the front yard were removed, the front landing and stairs were removed, the side and rear landings and chimney were removed, and the extension at the rear of the structure was removed. The foundation for the proposed addition was partially excavated. Soil and broken concrete were stockpiled in the back yard. The front of the property was fenced off to limit unauthorized access. During EcoTec’s inspection on March 14, 2022, there was no evidence of erosion or sedimentation from the site.

The findings of remote research and site observations and survey are discussed below.

Vegetated Wetlands, Streams, and Buffer Zone/Adjacent Upland Resource Area: Based upon remote research and observations of the subject site and surrounding areas, no bordering or isolated vegetated wetlands or ponds, lakes, streams, or rivers subject to jurisdiction under the Act/Regulations or Bylaw/Bylaw Regulations were observed on or within 100 feet of the subject site during the inspection. Specifically, there were no water bodies or stream or river channels,

no areas where wetland plant species were predominant, and no areas where evidence of prolonged flooding or soils with hydric characteristics were observed on or within 100 feet of the subject site. As such, Land Under Water Bodies and Waterways, Bank, Bordering Vegetated Wetlands, and Isolated Land Subject to Flooding do not occur on the subject site and the 100' Buffer Zone/Adjacent Upland Resource Area to Bank or Bordering Vegetated Wetlands under the Regulations and Bylaw/Bylaw Regulations do not occur on the subject site.

Floodplain: Based upon a review of the Flood Insurance Rate Map, Map Number 25017C0419E with an Effective Date of June 4, 2010 (Dynamic FIRMette attached), the subject site is partially mapped as Zone AE with a 100-year flood elevation of 7 feet NAVD 1988 and as Other Flood Areas: Zone X, which is defined as areas subject to the 0.2% annual chance flood (i.e., 500-year floodplain). The vicinity of the subject site is covered by a Letter of Map Revision (LOMR; Case 15-01-2142P, Effective Date April 8, 2016; attached); Profiles E and F, which are located upgradient and downgradient of the site, have a 100-year flood elevation of 6.8 feet NAVD 1988 in Table 12 of the LOMR, which are reflected on the Dynamic FIRMette. Based upon a topographical survey at the same datum, it was determined that the entire subject site is located above the 100-year flood elevation in the area (i.e., 7 feet NAVD 1988) with the lowest elevation on the subject site at 8.39 feet. As such, based upon the site survey that shows the entire site above the 100-year flood elevation of 7 feet NAVD 1988 (see Existing Conditions Plan and Note 4 on said plan), the subject site is not located within Bordering Land Subject to Flooding under the Act or Bylaw. Bordering Land Subject to Flooding does not have a 100-foot Buffer Zone/Adjacent Upland Resource Area under the Regulations or Bylaw/Bylaw Regulations.

Riverfront Area: The Massachusetts Rivers Protection Act amended the Act to establish an additional wetland resource area: Riverfront Area. Based upon a review of the current USGS Map (i.e., Boston North Quadrangle, dated 1985, attached), there are no streams mapped on or within 200 feet of the subject site. Alewife Brook is mapped as perennial and is located over 200 feet to the southeast of the subject site (see Town of Arlington GIS Map). Alewife Brook is contained within a well-defined channel in the vicinity of the subject site. Based upon observations made during the inspection, there are no unmapped streams located on or within 200 feet of the subject site. Given the above, Riverfront Area under the Act/Regulations and Bylaw/Bylaw Regulations would not occur on the subject site. Riverfront Area does not have a Buffer Zone under the Act/Regulations or Bylaw/Bylaw Regulations.

Rare Species Habitat and Vernal Pools: The Regulations require that no project may be permitted that will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures set forth at 310 CMR 10.59. Based upon a review of the *Massachusetts Natural Heritage Atlas*, 15<sup>th</sup> edition, valid from August 1, 2021 and Certified Vernal Pools and Potential Vernal Pools from MassGIS (attached), there are no Estimated Habitats [for use with the Act and Regulations (310 CMR 10.00 *et seq.*)], Priority

Habitats [for use with Massachusetts Endangered Species Act (M.G.L. Ch. 131A; “MESA”) and MESA Regulations (321 CMR 10.00 *et seq.*)], or mapped Certified or Potential Vernal Pools on the subject site or within 100 feet of the subject site.

The reader should be aware that the regulatory authority for determining wetland jurisdiction rests with local, state, and federal authorities.

### **Project Description and Analysis:**

The proposed project consists of the partial demolition of the existing residential structure and the construction of an addition and renovations to the existing residential structure. The proposed structure includes new front stairs and landings for each unit, a window well for each unit, a rear balcony and rear post supported deck with stairs for each unit, and open stairs to access the basement at the rear of each unit. Concrete block walkways are proposed for each unit to connect the driveways to the stairs to the rear decks. The existing paved driveways will be removed and replaced with permeable paver driveways. Roof runoff from the entire residential structure will be collected in gutters and routed via downspouts to drain lines and clean-outs connected to an infiltration system proposed to the south of the structure. This infiltration structure will also receive drainage from the window wells and rear stair drains and from the proposed precautionary sump pumps. One eastern white pine tree was removed from the front of the site; the deciduous tree in the southwestern portion of the site will be retained and protected during construction. The street tree adjacent to the eastern driveway will also be protected during construction. Twenty native shrubs of six species, including two flowering dogwood which will grow to be small understory trees, are proposed to be planted in a staggered row inside the existing wooden fence near the southern property boundary.

The project plans include an erosion control barrier consisting of a fiber roll or compost sock (minimum 8” diameter) located at the site perimeter, catch basin inlet protection for the two catch basins in Lafayette Street near the site, and a construction entrance at each driveway access following pavement removal during continued site construction. Stockpiling will occur within the limit of work with excess soil removed from the site. Areas disturbed as part of the project will be returned to the existing grade and seeded or sodded as lawn. Again, native shrub plantings are proposed in the southern portion of the subject site; these plantings are proposed beneath larger trees located off-site to the south and will provide some native habitat in this portion of the site. The erosion control barrier will remain in place until the site is stabilized.

Under existing conditions, there is no control or treatment of driveway runoff from the paved driveways; under proposed conditions, the paved driveways will be replaced with permeable paver driveways that are designed and constructed to promote infiltration. Under existing conditions, roof runoff is discharged to the ground surface; under proposed conditions, roof runoff will be collected in gutters and routed via downspouts to drain lines and clean-outs

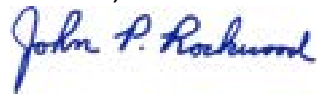
connected to an infiltration system proposed to the south of the structure. A Stormwater Report prepared by Spruhan Engineering PC is included with this RDA. The proposed plan represents a significant improvement over existing conditions with regard to stormwater control and treatment and will promote infiltration and significantly reduce surface runoff from the site.

The site is located above the 100-year floodplain but is designed with a look to the future where the floodplain elevation may rise. The first-floor elevations of the existing structure and proposed addition are well above the 100-year flood elevation. The basement window wells and the rear stairs to the basement have been designed with walls that are well above the 100-year floodplain elevation.

Again, the Applicant is seeking a Negative Determination 4 under the Act and a Negative Determination 6 under the Bylaw as the subject site is located and the proposed work occurs outside geographical jurisdiction under the Act and Bylaw.

We look forward to meeting remotely with the Conservation Commission on this matter on April 21, 2022. If you have any questions, please feel free to contact me at any time.

Cordially,  
ECOTEC, INC.

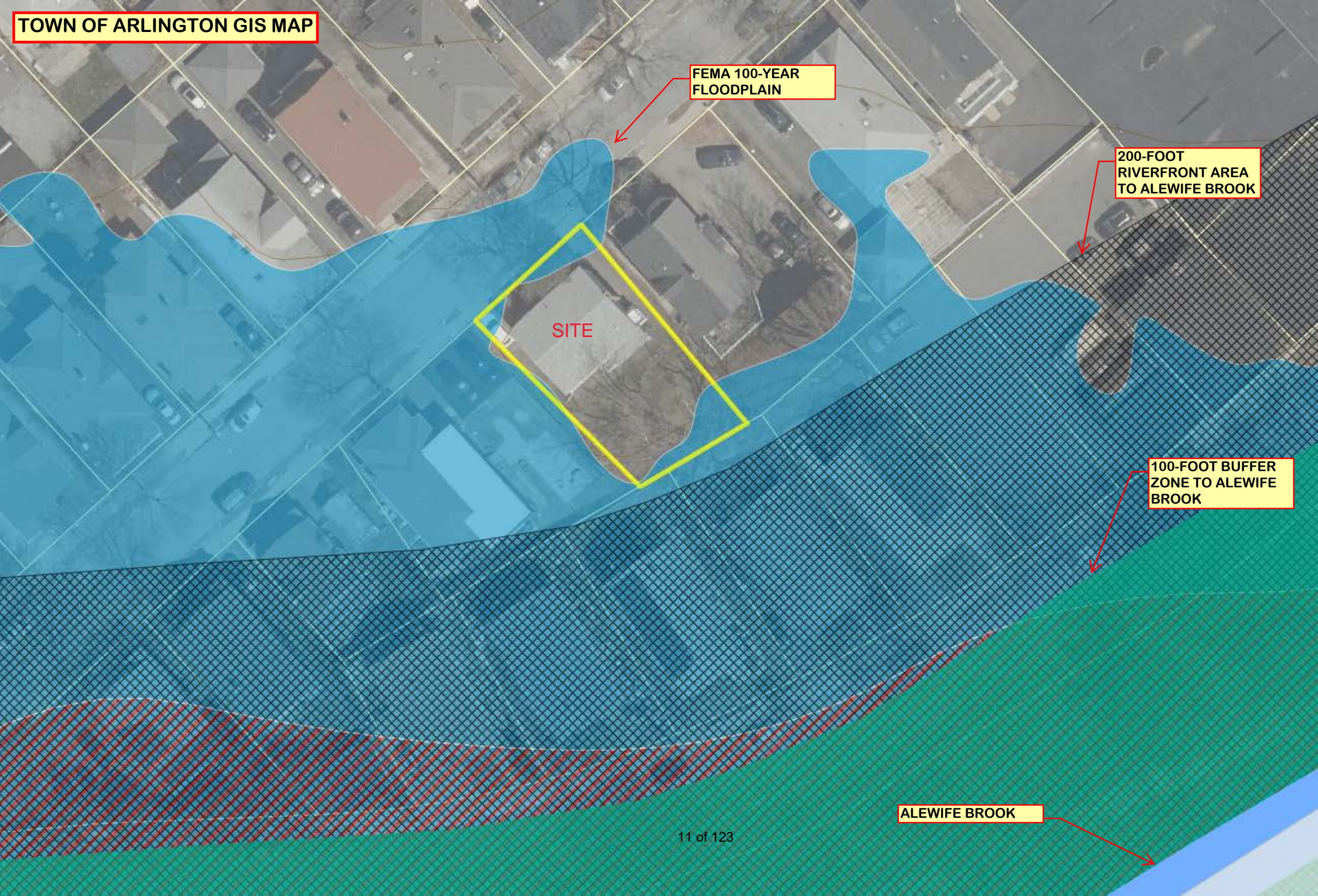


John P. Rockwood, Ph.D., SPWS  
Principal Environmental Scientist

Cc: Department of Environmental Protection, Northeast Regional Office (by Certified Mail  
/Return Receipt Requested)  
Bruna Rossetti, North America Development (via Email)  
Edmond Spruhan, P.E., Spruhan Engineering, P.C. (via Email)  
Peter Nolan, PLS, Peter Nolan & Associates, LLC (via Email)

18: ARLINGTON20LAFAYETTE RDA COVER LETTER

TOWN OF ARLINGTON GIS MAP



FEMA 100-YEAR  
FLOODPLAIN

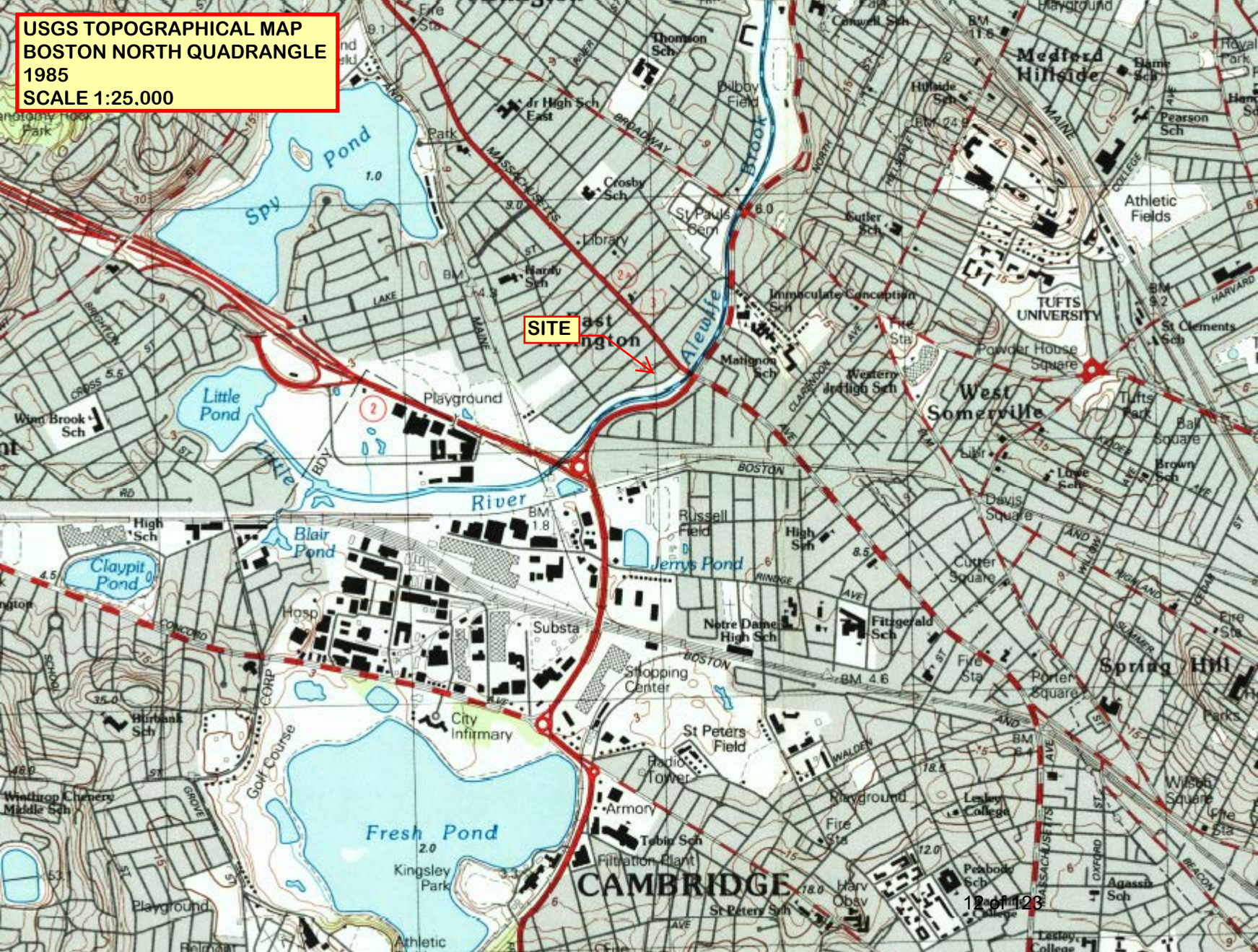
200-FOOT  
RIVERFRONT AREA  
TO ALEWIFE BROOK

SITE

100-FOOT BUFFER  
ZONE TO ALEWIFE  
BROOK

ALEWIFE BROOK

**USGS TOPOGRAPHICAL MAP  
BOSTON NORTH QUADRANGLE  
1985  
SCALE 1:25,000**





























The map displays the following features:

- Geographic Labels:**
  - Town of Arlington 250177
  - City of Cambridge 250186
  - Somerville
- Flood Hazard Zones:**
  - Zone X (Area of Minimal Flood Hazard)
  - Zone AE
- Infrastructure and Features:**
  - Highway E
  - 25017C0419E eff. 6/4/2010 FLOODWAY
  - LOMR 15-01-2142P eff. 4/8/2016
  - 6.8 FEET (multiple locations)
  - 7 FEET
  - FLOOD DISCHARGE CONTAINED IN STRUCTURE
- Site Identification:**
  - SITE** (indicated by a red arrow pointing to a specific location within the flood zones)
- Scale and Orientation:**
  - Scale bar: 0 to 2,000 Feet
  - Scale: 1:6,000
  - Coordinates: 71°7'58" W 42°23'51" N

SEE FIVE REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

		Without Base Flood Elevation (BFE) Zone A, V, A99
<b>SPECIAL FLOOD HAZARD AREAS</b>		With BFE or Depth (Zone AE, AO, AH, VE, AR) Regulatory Floodway
		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile (Zone X)
		Future Conditions 1% Annual Chance Flood Hazard (Zone X)
<b>OTHER AREAS OF FLOOD HAZARD</b>		Area with Reduced Flood Risk due to Levee. See Notes. (Zone X)
		Area with Flood Risk due to Levee (Zone D)
		NO SCREEN Area of Minimal Flood Hazard (Zone A)
<b>OTHER AREAS</b>		EFFECTIVE LOMR
		Area of Undetermined Flood Hazard (Zone D)
<b>GENERAL STRUCTURES</b>		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
<b>OTHER FEATURES</b>		Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
<b>MAP PANELS</b>		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped





The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 1/21/2022 at 12:13 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



# Federal Emergency Management Agency

Washington, D.C. 20472

## LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	Town Of Belmont Middlesex County Massachusetts	EXCAVATION	FLOODWAY HYDRAULIC ANALYSIS NEW TOPOGRAPHIC DATA
	COMMUNITY NO.: 250182		
IDENTIFIER	Vox On II Residence Of Alewife	APPROXIMATE LATITUDE & LONGITUDE: 42.400, -71.151 SOURCE: USGS QUADRANGLE    DATUM: NAD 83	
ANNOTATED MAPPING ENCLOSURES		ANNOTATED STUDY ENCLOSURES	
NO REVISION TO THE EFFECTIVE FLOOD INSURANCE RATE MAPS		DATE OF EFFECTIVE FLOOD INSURANCE STUDY: July 07, 2014 FLOODWAY DATA TABLE: 12	

Enclosures reflect changes to flooding sources affected by this revision.

### FLOODING SOURCES & REVISED REACHES

Alewife Brook (Little River) - From the Route 2 Crossing to approximately 2,000 feet upstream of the Route 2 Crossing

Wellington Brook – From the confluence of Alewife Brook to approximately 600 feet upstream of the confluence of Alewife Brook

### SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Alewife Brook (Little River)	BFEs*	BFEs	YES	NONE
Wellington Brook	BFEs	BFEs	YES	NONE

\* BFEs - Base Flood Elevations

### DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 847 South Pickett Street, Alexandria, VA 22304-4605. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

Luis Rodriguez, P.E., Chief  
Engineering Management Branch  
Federal Insurance and Mitigation Administration



Federal Emergency Management Agency  
Washington, D.C. 20472

**LETTER OF MAP REVISION  
DETERMINATION DOCUMENT (CONTINUED)**

**OTHER COMMUNITIES AFFECTED BY THIS REVISION**

**CID Number:** 250177      **Name:** Town Of Arlington, Massachusetts

AFFECTED MAP PANELS	AFFECTED PORTIONS OF THE FLOOD INSURANCE STUDY REPORT
NO REVISION TO THE EFFECTIVE FLOOD INSURANCE RATE MAPS	DATE OF EFFECTIVE FLOOD INSURANCE STUDY: July 7, 2014 FLOODWAY DATA TABLE: 12

**CID Number:** 250186      **Name:** City Of Cambridge, Massachusetts

AFFECTED MAP PANELS	AFFECTED PORTIONS OF THE FLOOD INSURANCE STUDY REPORT
NO REVISION TO THE EFFECTIVE FLOOD INSURANCE RATE MAPS	DATE OF EFFECTIVE FLOOD INSURANCE STUDY: July 7, 2014 FLOODWAY DATA TABLE: 12

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 847 South Pickett Street, Alexandria, VA 22304-4605. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

Luis Rodriguez, P.E., Chief  
Engineering Management Branch  
Federal Insurance and Mitigation Administration



## Federal Emergency Management Agency

Washington, D.C. 20472

### LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

#### COMMUNITY INFORMATION

##### APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

##### COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance flood discharges computed in the FIS for your community without considering subsequent changes in watershed characteristics that could increase flood discharges. Future development of projects upstream could cause increased flood discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on flood discharges subsequent to the publication of the FIS report for your community and could, therefore, establish greater flood hazards in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 847 South Pickett Street, Alexandria, VA 22304-4605. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

A handwritten signature in black ink, appearing to read "Luis Rodriguez", is located above the typed name.

Luis Rodriguez, P.E., Chief  
Engineering Management Branch  
Federal Insurance and Mitigation Administration



**Federal Emergency Management Agency**  
Washington, D.C. 20472

**LETTER OF MAP REVISION  
DETERMINATION DOCUMENT (CONTINUED)**

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Mr. Dean Savramis  
Director, Mitigation Division  
Federal Emergency Management Agency, Region I  
99 High Street, Sixth Floor  
Boston, MA 02110  
(617) 832-4764

**STATUS OF THE COMMUNITY NFIP MAPS**

We will not physically revise and republish the FIS report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 847 South Pickett Street, Alexandria, VA 22304-4605. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

A handwritten signature in blue ink, likely belonging to Luis Rodriguez, P.E., is positioned above the printed name.

Luis Rodriguez, P.E., Chief  
Engineering Management Branch  
Federal Insurance and Mitigation Administration



Federal Emergency Management Agency  
Washington, D.C. 20472

**LETTER OF MAP REVISION  
DETERMINATION DOCUMENT (CONTINUED)**

**PUBLIC NOTIFICATION OF REVISION**

A notice of changes will be published in the *Federal Register*. This information also will be published in your local newspaper on or about the dates listed below and through FEMA's Flood Hazard Mapping website at [https://www.floodmaps.fema.gov/fhm/Scripts/bfe\\_main.asp](https://www.floodmaps.fema.gov/fhm/Scripts/bfe_main.asp).

**LOCAL NEWSPAPER**

Name: *Belmont Citizen Herald*

Dates: December 3, 2015 and December 10, 2015

Within 90 days of the second publication in the local newspaper, a citizen may request that we reconsider this determination. Any request for reconsideration must be based on scientific or technical data. Therefore, this letter will be effective only after the 90-day appeal period has elapsed and we have resolved any appeals that we receive during this appeal period. Until this LOMR is effective, the revised flood hazard determination presented in this LOMR may be changed.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 847 South Pickett Street, Alexandria, VA 22304-4605. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

A handwritten signature in black ink, appearing to read "Luis Rodriguez".

Luis Rodriguez, P.E., Chief  
Engineering Management Branch  
Federal Insurance and Mitigation Administration

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Aberjona River North Spur								
A	130 <sup>1</sup>	33	148	0.9	64.3	64.3	64.3	0.0
B	2,260 <sup>1</sup>	68*	324	0.6	68.1	68.1	68.1	0.0
C	2,860 <sup>1</sup>	152*	203	0.9	68.2	68.2	68.2	0.0
D	4,400 <sup>1</sup>	124*	713	0.5	75.8	75.8	75.8	0.0
E	6,500 <sup>1</sup>	18	15	2.1	78.3	78.3	78.3	0.0
F	7,880 <sup>1</sup>	47*	68	1.1	81.5	81.5	81.5	0.0
G	9,410 <sup>1</sup>	18*	27	0.5	83.0	83.0	83.0	0.0
Alewife Brook (Little River)								
A	100 <sup>2</sup>	77*	427	1.1	6.7	3.9 <sup>4</sup>	4.1	0.2
B	250 <sup>2</sup>	101*	399	1.2	6.7	3.9 <sup>4</sup>	4.1	0.2
C	2,960 <sup>2</sup>	74	381	1.2	6.7	4.1 <sup>4</sup>	4.3	0.2
D	3,970 <sup>2</sup>	56*	372	1.5	6.7	4.5 <sup>4</sup>	4.8	0.3
E	5,220 <sup>2</sup>	84*	327	1.2	6.8	4.7 <sup>4</sup>	5.0	0.3
F	7,330 <sup>2</sup>	500*	1,135	0.3	6.8	5.0 <sup>4</sup>	5.4	0.4
G	7,770 <sup>2</sup>	1,556*	2,294	0.2	6.8	5.2 <sup>4</sup>	5.5	0.3
H	8,010 <sup>2</sup>	1,675*	3,477	0.1	6.8	5.2 <sup>4</sup>	5.5	0.3
I	11,625 <sup>2</sup>	70	569	0.8	7.4	6.4 <sup>4</sup>	7.2	0.8
Angelica Brook								
A	500 <sup>3</sup>	16	23	6.9	190.1	190.1	190.1	0.0
B	1,360 <sup>3</sup>	8	25	6.4	207.1	207.1	207.9	0.8
C	2,770 <sup>3</sup>	100	525	0.3	223.4	223.4	223.4	0.0

REVISED DATA

REVISED TO REFLECT LOMR  
EFFECTIVE APRIL 8, 2016

<sup>1</sup> Feet above confluence with Aberjona River

<sup>3</sup> Feet above confluence with Reservoir No. 3

<sup>2</sup> Feet above confluence with Mystic River

<sup>4</sup> Elevation computed without consideration of backwater effects from Mystic River

\* The measured top width on the FIRM may differ due to the effects of ineffective flow, the exclusion of small pocket areas due to map scale limitations, or is estimated due to HEC-RAS modeling limitations

TABLE 12

FEDERAL EMERGENCY MANAGEMENT AGENCY

MIDDLESEX COUNTY, MA  
(ALL JURISDICTIONS)

FLOODWAY DATA

ABERJONA RIVER NORTH SPUR – ALEWIFE  
BROOK (LITTLE RIVER) – ANGELICA BROOK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Wellington Brook								
A	590	31	77	1.9	6.8	5.3 <sup>2</sup>	5.6	0.3
B	1,450	27*	64	2.6	6.9	6.5 <sup>2</sup>	6.5	0.0
C	3,770	23*	90	1.1	7.7	7.7	7.7	0.0
D	5,730	10*	17	6.3	15.1	15.1	15.1	0.0
E	6,190	32	39	2.6	17.9	17.9	18.0	0.1
F	6,460	16	24	4.1	20.2	20.2	20.3	0.1

<sup>1</sup> Feet above confluence with Alewife Brook (Little River)

<sup>2</sup> Elevation computed without consideration of backwater effects from Alewife Brook (Little River)

\* The measured top width on the FIRM may differ due to the effects of ineffective flow, the exclusion of small pocket areas due to map scale limitations, or is estimated due to HEC-RAS modeling limitations

REVISED DATA

REVISED TO REFLECT LOMR  
EFFECTIVE APRIL 8, 2016

TABLE 12

FEDERAL EMERGENCY MANAGEMENT AGENCY

MIDDLESEX COUNTY, MA  
(ALL JURISDICTIONS)

FLOODWAY DATA

WELLINGTON BROOK

20 of 123

NHESP ATLAS, 15TH EDITION, AUGUST 1, 2021  
PRIORITY HABITAT, ESTIMATED HABITAT AND  
CERTIFIED AND POTENTIAL VERNAL POOLS  
SCALE 1:36,112  
CREATED MARCH 24, 2022



**EcoTec, Inc.**  
**ENVIRONMENTAL CONSULTING SERVICES**  
**102 Grove Street**  
**Worcester, MA 01605-2629**  
**508-752-9666 – Fax: 508-752-9494**

**John P. Rockwood, Ph.D., SPWS**  
**Principal Environmental Scientist**

Dr. John P. Rockwood has been a Staff Scientist with EcoTec, Inc. since October 1999. He was previously a Chief Environmental Scientist at Sanford Ecological Services, Inc. of Southborough, Massachusetts from September 1990 to October 1999. Dr. Rockwood was certified in August 2002 and recertified in March 2008, January 2013, and June 2018 as a Professional Wetland Scientist (PWS) by the Society of Wetland Scientists Professional Certification Program (SWSPCP), and in April 2020, he was made a Senior Professional Wetland Scientist (SPWS) by the SWSPCP. His project experience includes wetland resource evaluation, delineation, and permitting at the local, state, and federal levels; wildlife habitat evaluation; pond and stream evaluation; vernal pool evaluation, certification, construction/replication, and monitoring; rare species habitat and impact assessment; wetland replacement, replication, and restoration area design, construction, and monitoring; invasive species removal and treatment protocols and monitoring; and expert testimony preparation. He has served as a consultant to municipalities, conservation commissions, the development community, engineering and survey firms, industry, and citizen's groups. He has managed and participated in a wide variety of wetlands-related projects ranging in scope from single-family house lots to subdivisions, commercial developments, mixed use developments, golf courses, a water park, MBTA commuter train station, and a regional mall. He has assessed the potential impacts of stormwater runoff, landfill leachate, and/or hazardous waste disposal sites on rare vertebrate and/or invertebrate species, and has conducted and/or directed surveys, delineated actual habitat, conducted habitat evaluations, and/or developed mitigation strategies necessary to protect rare vertebrate, invertebrate, and plant species and their habitats from proposed development-related impacts. He has designed and conducted drift fence studies for rare vertebrates. He has conducted and led preconstruction sweeps for the spotted turtle, wood turtle, and eastern box turtle. He has filed MESA Project Review Checklists for numerous species and has prepared applications for Conservation and Management Permits and Amendments for the eastern box turtle and marbled salamander under MESA. He has submitted rare animal and plant observation forms to NHESP for several vertebrate, invertebrate, and plant species. He has conducted environmental impact assessments and has prepared MEPA documentation related to an office park, an MBTA commuter train station, water park, residential subdivisions, skating rink facility, landfill, and regional mall. Dr. Rockwood also has extensive experience in environmental site assessment related to possible oil and/or hazardous material contamination. He has conducted numerous environmental assessments, several including subsurface investigations, for sites located in Massachusetts, and has conducted preliminary environmental assessments for properties located in New York, New Hampshire, and Rhode Island. He has conducted ecological risk assessments (i.e., Stage I Environmental Screenings and Stage II Environmental Risk Characterizations) for a number of disposal sites in Massachusetts, including several disposal sites that had the potential to affect state-listed vertebrate and invertebrate species, and has utilized the EPA Rapid Bioassessment Protocol for macroinvertebrates to assess potential impacts of disposal sites and hazardous material releases on streams and rivers in Massachusetts and New York. He has served as the environmental contractor to the Franklin Consolidated Office of the Federal Deposit Insurance Corporation (FDIC-FCO) for 16 months, where he reviewed environmental reports, prepared scopes-of-work for site assessments, and provided technical advice to FDIC employees related to environmentally compromised assets. Dr. Rockwood has designed, conducted, and evaluated numerous surface water and groundwater monitoring programs. His prior research includes laboratory studies of the effects of low pH and aluminum on dragonfly nymphs and a field survey of the impact of chlorinated sewerage effluent on algal periphyton community dynamics. Dr. Rockwood is the co-author of a textbook on aquatic biology and is the principal author of three peer-reviewed research publications in the field of aquatic toxicology that address the effect of low pH and aluminum on nymphs of the dragonfly *Libellula julia*. Dr. Rockwood served as the as the Editor of the AMWS Newsletter from November 2004 to October 2010 and as Assistant Editor from May 2003 to November 2004 and October 2010 to January 2012. He served as President of the Association of Massachusetts Wetland Scientists from November 2013 to December 2015 and as Immediate Past President from December 2015 to December 2017. He was twice awarded by AMWS with their President's Award.

**Education:** Doctor of Philosophy (Ph.D.): Aquatic Pollution Biology – Plant and Soil Sciences  
University of Massachusetts at Amherst, 1989  
Bachelor of Science (B.S.): Environmental Sciences, *Summa Cum Laude*  
University of Massachusetts at Amherst, 1984

**Professional Affiliations:** Society for Freshwater Science  
Sigma Xi, Full Member  
Association of Massachusetts Wetland Scientists, Voting Member  
Society of Wetland Scientists  
Massachusetts Association of Conservation Commissions

**Certifications:** Society of Wetlands Scientists Senior Professional Wetland Scientist, Certification Number 1349  
OSHA Health and Safety Training, 40-Hour Training, 29 CFR 1910.120  
OSHA Health and Safety Training, 8-Hour Supervisor Training  
OSHA Health and Safety Training, 8-Hour Refresher Training



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands

ARLINGTON  
City/Town

# WPA Form 1- Request for Determination of Applicability

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

## A. General Information

### Important:

When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. Applicant:

Bruna Rossetti, North America Development LLC

Name

93 Broadway

Mailing Address

Somerville

City/Town

617-996-6728

Phone Number

bruna@northamericadevelopment.com

MA  
State

02145  
Zip Code

--  
Fax Number (if applicable)

2. Representative (if any):

EcoTec, Inc.

Firm

John P. Rockwood, Ph.D., SPWS

Contact Name

102 Grove Street

Mailing Address

Worcester

City/Town

508-752-9666 x3

Phone Number

jrockwood@ecotecinc.com

E-Mail Address

MA  
State

01605  
Zip Code

--  
Fax Number (if applicable)

## B. Determinations

1. I request the Arlington make the following determination(s). Check any that apply:  
Conservation Commission

- ☒ a. whether the **area** depicted on plan(s) and/or map(s) referenced below is an area subject to jurisdiction of the Wetlands Protection Act.
- ☐ b. whether the **boundaries** of resource area(s) depicted on plan(s) and/or map(s) referenced below are accurately delineated.
- ☒ c. whether the **work** depicted on plan(s) referenced below is subject to the Wetlands Protection Act.
- ☒ d. whether the area and/or work depicted on plan(s) referenced below is subject to the jurisdiction of any **municipal wetlands ordinance** or **bylaw** of:

Arlington

Name of Municipality

- ☐ e. whether the following **scope of alternatives** is adequate for work in the Riverfront Area as depicted on referenced plan(s).

--



## WPA Form 1- Request for Determination of Applicability

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

### C. Project Description

1. a. Project Location (use maps and plans to identify the location of the area subject to this request):

20-20A Lafayette Street

Street Address

Arlington

City/Town

001.0

Assessors Map/Plat Number

0004 0016.A

Parcel/Lot Number

- b. Area Description (use additional paper, if necessary):

The subject site, 20-20A Lafayette Street, is a 0.108-acre (4,689.7 square foot) parcel located to the southeast of Lafayette Street in Arlington, Massachusetts (see Town of Arlington GIS Map, USGS Map, and Plan Set).

Based upon the site survey and observations made at and near the site, no Wetland Resource Areas or associated Buffer Zone occur on the subject site. See Cover Letter for the Wetland Resource Evaluation and for a discussion of existing and proposed site conditions.

- c. Plan and/or Map Reference(s):

A complete list of materials included as part of this Request is provided in the Cover Letter.

2. a. Work Description (use additional paper and/or provide plan(s) of work, if necessary):

Generally, the proposed project consists of the construction of an addition and renovations to an existing residential structure and the removal and replacement of various site features (e.g., driveways, walkways, etc.). Erosion controls, sedimentation protection, stormwater infiltration via permeable paver driveways and an infiltration system to address roof runoff, and native plantings are proposed. See Cover Letter and Plan Set for additional information on the proposed project.

The Applicant is seeking a Negative Determination 4 under the Act and a Negative Determination 6 under the Town of Arlington Bylaw as the subject site is located and proposed work occurs outside of geographic jurisdiction under the Act and Bylaw.



**Massachusetts Department of Environmental Protection**

Bureau of Resource Protection - Wetlands

ARLINGTON

City/Town

**WPA Form 1- Request for Determination of Applicability**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

**C. Project Description (cont.)**

b. Identify provisions of the Wetlands Protection Act or regulations which may exempt the applicant from having to file a Notice of Intent for all or part of the described work (use additional paper, if necessary).

Based upon the Plan Set, remote research, and observations made on and near the subject site as detailed in the Wetland Resource Evaluation included in the Cover Letter, no Wetland Resource Areas or associated Buffer Zone/Adjacent Upland Resource Area under the Act or Bylaw occur on the site. As such, the subject site and proposed work are not subject to jurisdiction under the Act or the Bylaw.

3. a. If this application is a Request for Determination of Scope of Alternatives for work in the Riverfront Area, indicate the one classification below that best describes the project.

- ☐ Single family house on a lot recorded on or before 8/1/96
- ☐ Single family house on a lot recorded after 8/1/96
- ☐ Expansion of an existing structure on a lot recorded after 8/1/96
- ☐ Project, other than a single-family house or public project, where the applicant owned the lot before 8/7/96
- ☐ New agriculture or aquaculture project
- ☐ Public project where funds were appropriated prior to 8/7/96
- ☐ Project on a lot shown on an approved, definitive subdivision plan where there is a recorded deed restriction limiting total alteration of the Riverfront Area for the entire subdivision
- ☐ Residential subdivision; institutional, industrial, or commercial project
- ☐ Municipal project
- ☐ District, county, state, or federal government project
- ☐ Project required to evaluate off-site alternatives in more than one municipality in an Environmental Impact Report under MEPA or in an alternatives analysis pursuant to an application for a 404 permit from the U.S. Army Corps of Engineers or 401 Water Quality Certification from the Department of Environmental Protection.

b. Provide evidence (e.g., record of date subdivision lot was recorded) supporting the classification above (use additional paper and/or attach appropriate documents, if necessary.)

--



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands

ARLINGTON  
City/Town

**WPA Form 1- Request for Determination of Applicability**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

**D. Signatures and Submittal Requirements**

I hereby certify under the penalties of perjury that the foregoing Request for Determination of Applicability and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge.

I further certify that the property owner, if different from the applicant, and the appropriate DEP Regional Office were sent a complete copy of this Request (including all appropriate documentation) simultaneously with the submittal of this Request to the Conservation Commission.

Failure by the applicant to send copies in a timely manner may result in dismissal of the Request for Determination of Applicability.

Name and address of the property owner:

20 Lafayette LLC

Name

7650 SW 59 CT

Mailing Address

South Miami

City/Town

FL

State

33143

Zip Code

Signatures:

I also understand that notification of this Request will be placed in a local newspaper at my expense in accordance with Section 10.05(3)(b)(1) of the Wetlands Protection Act regulations.

Signature of Applicant

Date

3/23/22

Signature of Representative (if any)

Date

3/31/22

### Bylaw Filing Fees and Transmittal Form

**Rules:**

- 1.Fees are payable at the time of filing the application and are non-refundable.
- 2.Fees shall be calculated per schedule below.
- 3.Town, County, State, and Federal Projects are exempt from fees.
- 4.These fees are in addition to the fees paid under M.G.L. Ch. 131, s.40 (ACT).

**Fee Schedule** (ACC approved 1/8/15):

\$	No./Area	Category
\$ 150.00	1	<b>(R1) RDA-</b> \$150 local fee, no state fee
		<b>(N1) Minor Project</b> - \$200 (house addition, tennis court, swimming pool, utility work, work in/on/or affecting any body of water, wetland or floodplain).
		<b>(N2) Single Family Dwelling</b> - \$600
		<b>(N3) Multiple Dwelling Structures</b> - \$600 + \$100 per unit all or part of which lies within 100 feet of wetlands or within land subject to flooding.
		<b>(N4) Commercial, Industrial, and Institutional Projects</b> - \$800 + 50¢/s.f. wetland disturbed; 2¢/s.f. land subject to flooding or buffer zone disturbed.
		<b>(N5) Subdivisions</b> - \$600 + \$4/l.f. feet of roadway sideline within 100 ft. of wetlands or within land subject to flooding.
		<b>(N6) Other Fees</b> - copies, printouts; per public records law
		<b>(N7) Minor Project Change</b> - \$50
		<b>(N8) Work on Docks, Piers, Revetments, Dikes, etc</b> - \$4 per linear foot
		<b>(N9) Resource Boundary Delineation (ANRAD)</b> - \$1 per linear foot
		<b>(N10) Certificate of Compliance (COC or PCOC)</b> - No charge if before expiration of Order, \$200 if after that date.
		<b>(N11) Amendments</b> - \$300 or 50% of original local filing fee, whichever is less.
		<b>(N12) Extensions</b> -
		<b>a. Single family dwelling or minor project</b> - \$100.
		<b>b. Other</b> - \$150.
		<b>(N13) Consultant Fee</b> -per estimate from consultant
	<b>TOTAL</b>	<b>\$150.00</b>

**Note:** Submit this form along with the forms submitted for the ACT - the "Wetlands Filing Fee Calculations Worksheet," and the "Notice of Intent Fee Transmittal Form."

Account Redacted Copy of Filing Fee Check is attached.

21299

**ECOTEC, INC.**  
102 GROVE STREET  
WORCESTER, MA 01605  
(508) 752-9666



53-7102/2113



3/18/2022

PAY TO THE  
ORDER OF

Town of Arlington

\$ \*\*150.00

One Hundred Fifty and 00/100\*\*\*\*\*

DOLLARS

Town of Arlington

MEMO

Bylaw RDA Fee for 20 Lafayette Street, Arlington



*[Handwritten Signature]*  
AUTHORIZED SIGNATURE

Security features. Details on back.



**Legal Notice Charge Authorization**

DATE: April 1, 2022

TO: legals@wickedlocal.com

I hereby authorize Community Newspapers to bill me directly for the legal notice to be published in the Arlington Advocate newspaper on April 14, 2022 for a public hearing with the Arlington Conservation Commission to review a project at the following location:  
20/20A Lafayette Street, Arlington, MA.

Thank you.

Signed: \_\_\_\_\_

Send bill to:

John Rockwood (Address)  
EcoTec, Inc.  
102 Grove Street  
Worcester, MA 01605  
508-752-9666 x3 (Cell 508-294-2548)

EcoTec has an account with Wicked Local.  
Paul McManus, EcoTec, Inc., 508-752-9666 x1



Office of the Board of Assessors  
Robbins Memorial Town Hall  
Arlington, MA 02476  
(781) 316-3050  
Assessors@town.arlington.ma.us

## **Abutters List**

**Date:** March 14, 2022

**Subject Property Address:** 20-20A LAFAYETTE ST Arlington, MA

**Subject Property ID:** 1-4-16.A

**Search Distance:** 100 Feet - Conservation

The Board of Assessors certifies the names and addresses of requested parties in interest, all abutters to a single parcel within 100 feet.

BOARD OF ASSESSORS  
TOWN HALL  
ARLINGTON, MA 02476

---

**Board of Assessors**

**Abutters List**

Date: March 14, 2022

Subject Property Address: 20-20A LAFAYETTE ST Arlington, MA

Subject Property ID: 1-4-16.A

Search Distance: 100 Feet

---

Prop ID: 1-3-10  
Prop Location: 21-23 LAFAYETTE ST Arlington, MA  
Owner: ZHAO XIAOQIN  
Co-Owner:  
Mailing Address:  
23 LAFAYETTE ST  
ARLINGTON, MA 02474

---

Prop ID: 1-3-11  
Prop Location: 25 LAFAYETTE ST Arlington, MA  
Owner: LAITE GEORGE  
Co-Owner:  
Mailing Address:  
25 LAFAYETTE ST  
ARLINGTON, MA 02474

---

Prop ID: 1-3-6  
Prop Location: 7-9 LAFAYETTE ST Arlington, MA  
Owner: SULLIVAN MARIE T/  
Co-Owner: LIFE ESTATE  
Mailing Address:  
9 LAFAYETTE ST  
ARLINGTON, MA 02474

---

Prop ID: 1-3-7  
Prop Location: 11-13 LAFAYETTE ST Arlington, MA  
Owner: POLLANDER KURT C & ANN  
Co-Owner:  
Mailing Address:  
13 LAFAYETTE ST  
ARLINGTON, MA 02474

---

Prop ID: 1-3-9  
Prop Location: 19-19A LAFAYETTE ST Arlington, MA  
Owner: FULCINITI SILVESTRE-MARIA/  
Co-Owner: LIFE ESTATE  
Mailing Address:  
19A LAFAYETTE ST  
ARLINGTON, MA 02474

---

Prop ID: 1-4-13  
Prop Location: 30 LAFAYETTE ST Arlington, MA  
Owner: KREBS MARK R H  
Co-Owner: KREBS RACHEL L  
Mailing Address:  
DE SAVORNIN LOHMANPLEIN 3  
2314 EV LEIDEN  
THE NETHERLANDS,

---

Prop ID: 1-4-14.A  
Prop Location: 28 LAFAYETTE ST Arlington, MA  
Owner: WILLIAMS RYAN T & JANNINE/ TRS  
Co-Owner: WILLIAMS FAMILY REALTY TRUST  
Mailing Address:  
28 LAFAYETTE ST  
ARLINGTON, MA 02474

---

Prop ID: 1-4-16.A  
Prop Location: 20-20A LAFAYETTE ST Arlington, MA  
Owner: 20 LAFAYETTE LLC  
Co-Owner:  
Mailing Address:  
93 BROADWAY  
SOMERVILLE, MA 02145

---

Prop ID: 1-4-17  
Prop Location: 14-16 LAFAYETTE ST Arlington, MA  
Owner: MCLAUGHLIN LIMITED LLC  
Co-Owner:  
Mailing Address:  
24 TERESA CIR  
ARLINGTON, MA 02474

---

Prop ID: 1-4-4  
Prop Location: 11 BOULEVARD RD Arlington, MA  
Owner: KO NAI NAN ETAL/ TRUSTEES  
Co-Owner: NAN REALTY TRUST  
Mailing Address:  
40 TABOR HILL RD  
LINCOLN, MA 01773

---

Prop ID: 1-4-5  
Prop Location: 0-LOT BOULEVARD RD Arlington, MA  
Owner: KO NAI NAN ETAL/ TRUSTEES  
Co-Owner: NAN REALTY TRUST  
Mailing Address:  
40 TABOR HILL RD  
LINCOLN, MA 01773

---

Prop ID: 1-4-6  
Prop Location: 19-21 BOULEVARD RD Arlington, MA  
Owner: SMITH STIRLING  
Co-Owner: WHITCOMB JAMES  
Mailing Address:  
19 BOULEVARD RD  
ARLINGTON, MA 02474

---

Prop ID: 1-4-7  
Prop Location: 23-25 BOULEVARD RD Arlington, MA  
Owner: MCLAUGHLIN KEVIN J  
Co-Owner:  
Mailing Address:  
228 WASHINGTON ST  
BELMONT, MA 02478

---

Prop ID: 1-4-9  
Prop Location: 31-33 BOULEVARD RD Arlington, MA  
Owner: RATNER BARBARA  
Co-Owner:  
Mailing Address:  
31 BOULEVARD RD  
ARLINGTON, MA 02474

---

Prop ID: 1.A-3-8  
Prop Location: 15 LAFAYETTE ST UNIT 1 Arlington, MA  
Owner: STEINKE STEVEN M  
Co-Owner: KOWALCZUK MARY G  
Mailing Address:  
15 LAFAYETTE ST UNIT 1  
ARLINGTON, MA 02474

---

Prop ID: 1.A-3-9  
Prop Location: 15 LAFAYETTE ST UNIT 2 Arlington, MA  
Owner: DESMIDT REBECCA FRIEDMAN  
Co-Owner: LEVINE MICHAEL EDWARD  
Mailing Address:  
15 LAFAYETTE ST UNIT 2  
ARLINGTON, MA 02474

---

Prop ID: 1.A-4-18.1  
Prop Location: 10 LAFAYETTE ST UNIT 1 Arlington, MA  
Owner: URCIUOLI MATTHEW & NATALIYA  
Co-Owner:  
Mailing Address:  
10 LAFAYETTE ST UNIT 1  
ARLINGTON, MA 02474

---

Prop ID: 1.A-4-18.2  
Prop Location: 10 LAFAYETTE ST UNIT 2 Arlington, MA  
Owner: BUTMAN ROBERT  
Co-Owner: MCGRATH ERIN  
Mailing Address:  
10 LAFAYETTE ST UNIT 2  
ARLINGTON, MA 02474

---

Prop ID: 1.A-4-35  
Prop Location: 35-37 BOULEVARD RD UNIT 35 Arlington,  
MA  
Owner: DOYLE TIMOTHY A/TRUSTEE &  
Co-Owner: ZIABLAVA VALERYIA/TRUSTEE  
Mailing Address:  
35 BOULEVARD ROAD  
ARLINGTON, MA 02474

---

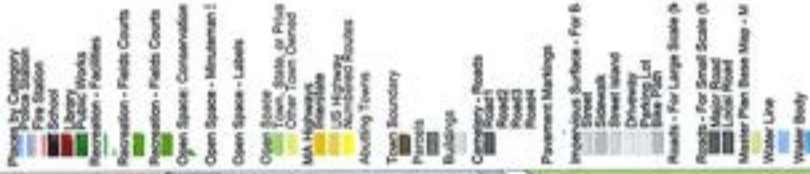
Prop ID: 1.A-4-37  
Prop Location: 35-37 BOULEVARD RD UNIT 37 Arlington,  
MA  
Owner: GOLMON STEPHANIE  
Co-Owner:  
Mailing Address:  
37 BOULEVARD RD #37  
ARLINGTON, MA 02474

---

Prop ID: 1.A-4-8  
Prop Location: 27 BOULEVARD RD UNIT 27 Arlington, MA  
Owner: EIFLER KRISTIN D  
Co-Owner:  
Mailing Address:  
27 BOULEVARD RD  
ARLINGTON, MA 02474

---

Prop ID: 1.A-4-9  
Prop Location: 29 BOULEVARD RD UNIT 29 Arlington, MA  
Owner: CONNOR DIANE  
Co-Owner:  
Mailing Address:  
29 BOULEVARD RD  
ARLINGTON, MA 02474



Printed on 03/14/2022 at 09:23 AM

Age group	Number of cases
0-14	10
15-24	20
25-34	30
35-44	40
45-54	50
55-64	60
65-74	70
75-84	180
85+	150

## ABUTTER NOTIFICATION

### Notification to Abutters under the Arlington Wetlands Protection Bylaw:

In accordance with the Arlington Wetlands Protection Bylaw, you are hereby notified of the following:

The Conservation Commission will hold a virtual public meeting using Zoom, on Thursday, April 21, 2022, at 7:00 PM in accordance with the provisions of the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131, s. 40, as amended), the Town of Arlington Bylaws Article 8, Bylaw for Wetland Protection, and in accordance with the Governor's Order Suspending Certain Provisions of the Open Meeting Law, G. L. c. 30A, § 20 relating to the COVID-19 emergency, for a Request for Determination of Applicability from North America Development LLC for an addition to an existing residential structure and associated site activities at 20/20A Lafayette Street, Arlington to make a determination whether the Act and/or Bylaw apply to the project site or to the proposed work at the subject property (Assessor's Map # 001.0, Lot # 004 0016.A).

Please refer to the Commission's online meeting agenda for specific Zoom meeting access information.

A copy of the application and accompanying plans are available by contacting the applicant's representative at 508-752-9666 ext. 3 or [jrockwood@ecotecinc.com](mailto:jrockwood@ecotecinc.com) or by contacting the Arlington Conservation Agent at 781-316-3229 or [dmorgan@town.arlington.ma.us](mailto:dmorgan@town.arlington.ma.us). For more information, please contact the applicant's representative at 508-752-9666 ext. 3 or [jrockwood@ecotecinc.com](mailto:jrockwood@ecotecinc.com). You may also contact the Arlington Conservation Commission at 781-316-3229 or the DEP Northeast Regional Office at 978-694-3200.

NOTE: Notice of the Public Hearing will be published at least five (5) business days in advance in *The Arlington Advocate* and will also be posted at least 48 hours in advance on the Arlington Town Hall website.

\*\*\*\*\*

### The information for the meeting on this matter is:

**Date: April 21, 2022**

**Time: 7:00 PM**

### AFFIDAVIT OF SERVICE

I, John P. Rockwood, Ph.D., SPWS, being duly sworn, do hereby state as follows: on April 1, 2022, I mailed an "Abutters Notification" in compliance the Arlington Wetlands Protection Bylaw, Title V, Article 8 of the Town of Arlington Bylaws in connection with the following matter:

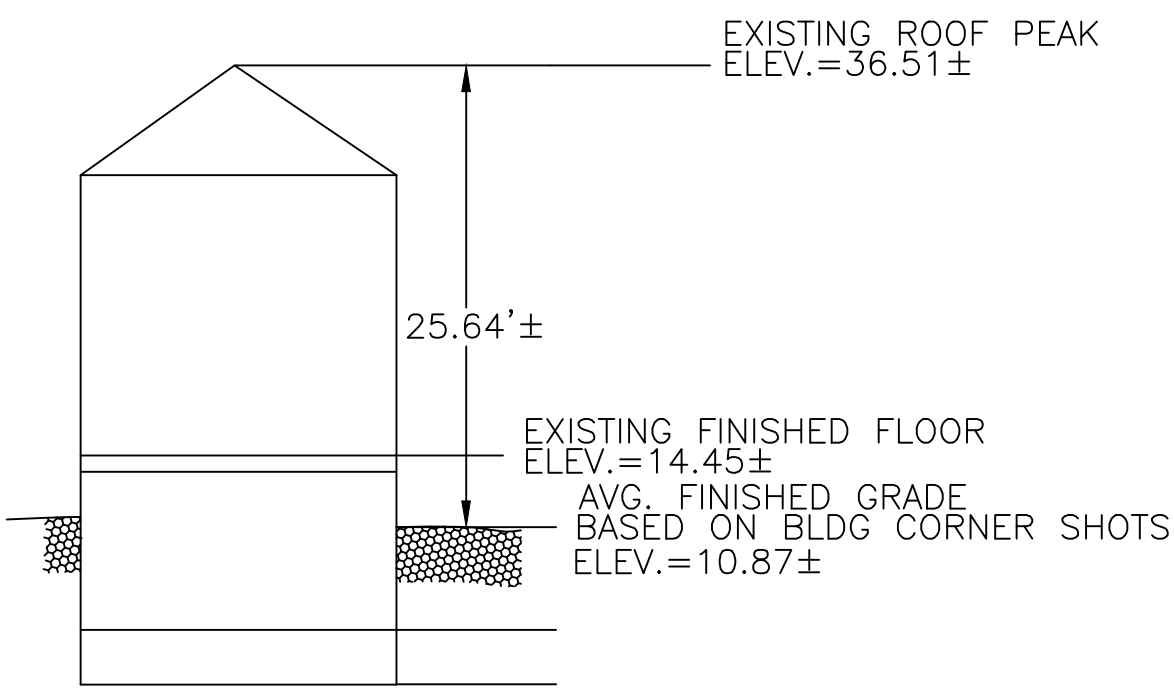
*Proposed addition to existing residential structure and associated site features at 20/20A Lafayette Street, Arlington, Massachusetts (Assessor's Map # 001.0, Lot # 0004 0016.A).*

The form of the notification, and a list of the abutters to whom it was provided and their addresses, are attached to this Affidavit of Service.

Signed under the pains and penalties of perjury, this 1<sup>st</sup> day of April 2022.

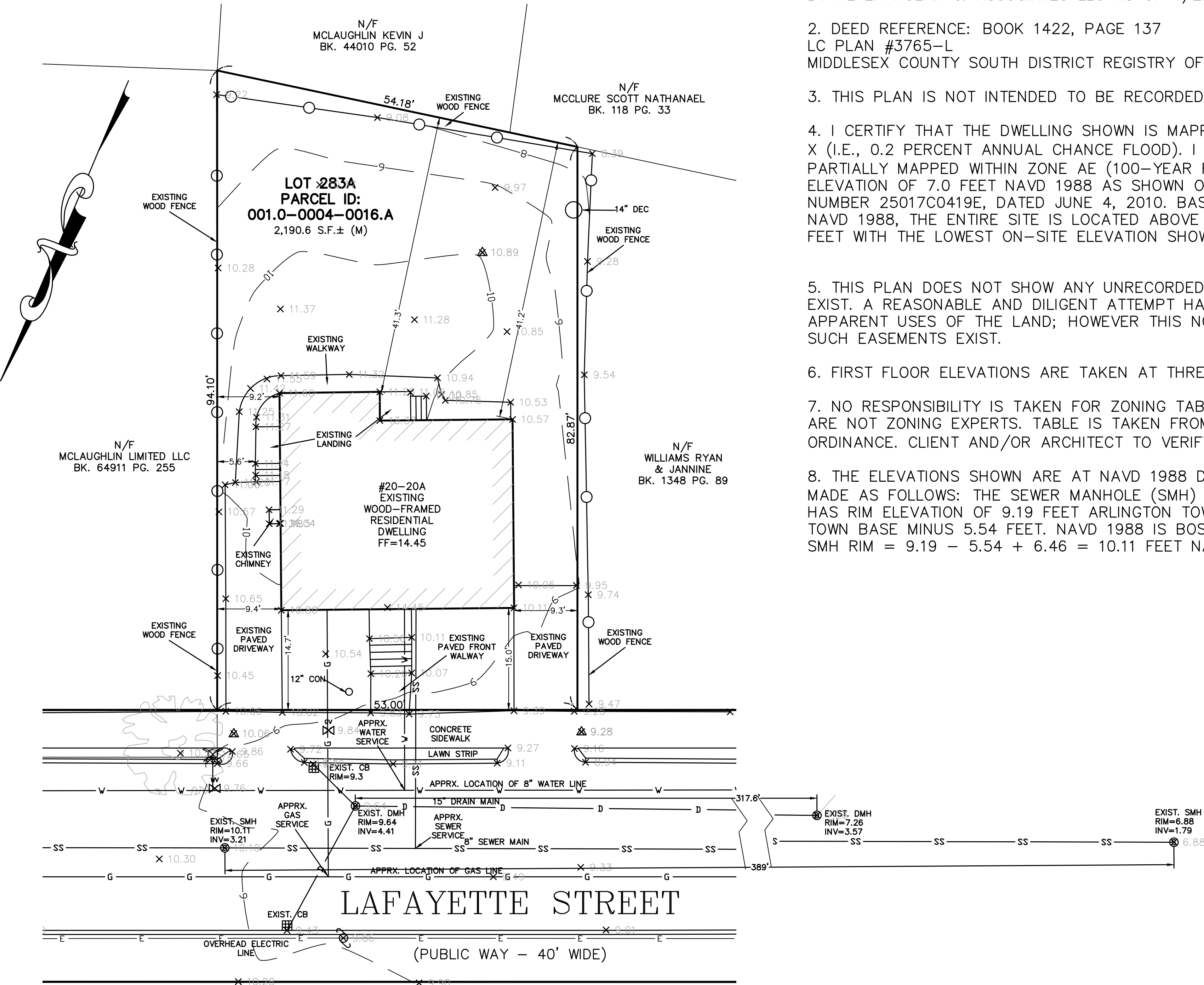
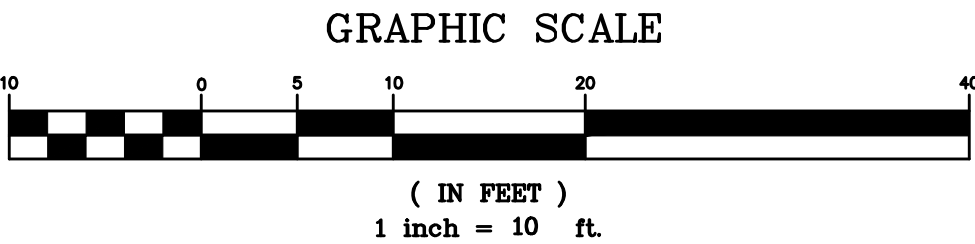


Name



EXISTING PROFILE  
NOT TO SCALE

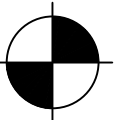
LEGEND	
	BOUND
	IRON PIN/PIPE
	STONE POST
	TREE
	TREE STUMP
	SHRUBS/FLOWERS
	SIGN
	BOLLARD
	SEWER MANHOLE
	DRAIN MANHOLE
	CATCH BASIN
	WATER MANHOLE
	WATER VALVE
	HYDRANT
	GAS VALVE
	ELECTRIC MANHOLE
	ELECTRIC HANDHOLE
	UTILITY POLE
	LIGHT POLE
	MANHOLE
	SPOT GRADE
	TOP OF WALL
	BOTTOM OF WALL
	EXISTING BUILDING
	RETAINING WALL
	STONE WALL
	FENCE
	TREE LINE
	SEWER LINE
	DRAIN LINE
	WATER LINE
	GAS LINE
	UNDERGROUND ELECTRIC LINE
	OVERHEAD WIRES
	CONTOUR LINE (MJR)
	CONTOUR LINE (MNR)



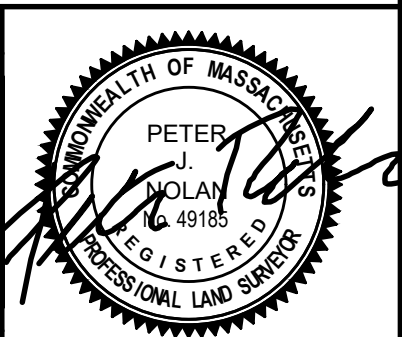
NOTES:

1. INFORMATION SHOWN ON THIS PLAN IS THE RESULT OF A FIELD SURVEY PERFORMED BY PETER NOLAN & ASSOCIATES LLC AS OF 4/22/2021.
2. DEED REFERENCE: BOOK 1422, PAGE 137  
LC PLAN #3765-L  
MIDDLESEX COUNTY SOUTH DISTRICT REGISTRY OF DEEDS
3. THIS PLAN IS NOT INTENDED TO BE RECORDED.
4. I CERTIFY THAT THE DWELLING SHOWN IS MAPPED WITHIN OTHER FLOOD AREAS: ZONE X (I.E., 0.2 PERCENT ANNUAL CHANCE FLOOD). I FURTHER CERTIFY THAT THE SITE IS PARTIALLY MAPPED WITHIN ZONE AE (100-YEAR FLOODPLAIN WITH 100-YEAR BASE FLOOD ELEVATION OF 7.0 FEET NAVD 1988 AS SHOWN ON FLOOD HAZARD BOUNDARY MAP NUMBER 25017C0419E, DATED JUNE 4, 2010. BASED UPON SITE SPECIFIC TOPOGRAPHY AT NAVD 1988, THE ENTIRE SITE IS LOCATED ABOVE THE 100-YEAR FLOOD ELEVATION OF 7.0 FEET WITH THE LOWEST ON-SITE ELEVATION SHOWN AS 8.39 FEET NAVD 1988.
5. THIS PLAN DOES NOT SHOW ANY UNRECORDED OR UNWRITTEN EASEMENTS WHICH MAY EXIST. A REASONABLE AND DILIGENT ATTEMPT HAS BEEN MADE TO OBSERVE ANY APPARENT USES OF THE LAND; HOWEVER THIS NOT CONSTITUTE A GUARANTEE THAT NO SUCH EASEMENTS EXIST.
6. FIRST FLOOR ELEVATIONS ARE TAKEN AT THRESHOLD.
7. NO RESPONSIBILITY IS TAKEN FOR ZONING TABLE AS PETER NOLAN & ASSOCIATES LLC ARE NOT ZONING EXPERTS. TABLE IS TAKEN FROM TABLE PROVIDED BY LOCAL ZONING ORDINANCE. CLIENT AND/OR ARCHITECT TO VERIFY THE ACCURACY OF ZONING ANALYSIS.
8. THE ELEVATIONS SHOWN ARE AT NAVD 1988 DATUM. CONVERSION TO NAVD 1988 WAS MADE AS FOLLOWS: THE SEWER MANHOLE (SMH) FROM SEWER ASSESSMENT PLAN #2312 HAS RIM ELEVATION OF 9.19 FEET ARLINGTON TOWN BASE. BOSTON BASE IS ARLINGTON TOWN BASE MINUS 5.54 FEET. NAVD 1988 IS BOSTON BASE PLUS 6.46 FEET.  
SMH RIM = 9.19 - 5.54 + 6.46 = 10.11 FEET NAVD 1988

SCALE 1"=10'			
DATE 5/11/2021	REV	DATE	REVISION
SHEET 1	20-20A LAFAYETTE STREET ARLINGTON MASSACHUSETTS		
PLAN NO. 1 OF 1			
CLIENT:	EXISTING CONDITIONS		
DRAWN BY DK			
CHKD BY P.J.N			
APPD BY P.J.N			



**PETER NOLAN & ASSOCIATES LLC**  
LAND SURVEYORS/CIVIL ENGINEERING CONSULTANTS  
80 JEWETT STREET, SUITE 2 NEWTON, MA 02458  
PHONE: 857 891 7478/617 782 1533 FAX: 617 202 5691  
EMAIL: pnolan@pnasurveyors.com



SHEET NO.

1

1. THE CONTRACTOR SHALL REPORT TO THE OWNER AND ENGINEER OF ANY SIGNIFICANT VARIATIONS IN EXISTING SITE CONDITIONS FROM THOSE SHOWN ON THESE PLANS. ANY PROPOSED REVISIONS TO THE WORK, IF REQUIRED BY THE OWNER, FOR ANY REASON, SHALL BE UNDERTAKEN UNTIL REVIEWED AND APPROVED BY THE OWNER AND THE ENGINEER.
2. IN ORDER TO PROTECT THE PUBLIC SAFETY DURING CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING AT ALL TIMES ALL NECESSARY SAFETY DEVICES AND PERSONNEL, WARNING LIGHTS, BARRICADES, AND POLICE OFFICERS.
3. ALL WORK SHALL CONFORM TO CITY OF SOMERVILLE GENERAL CONSTRUCTION STANDARDS.
4. THE CONTRACTOR SHALL REGULARLY INSPECT THE PERIMETER OF THE PROPERTY TO CLEAN UP AND REMOVE LOOSE CONSTRUCTION DEBRIS BEFORE IT LEAVES THE SITE. ALL DEMOLITION DEBRIS SHALL BE PROMPTLY REMOVED FROM THE SITE TO A LEGAL DUMP SITE. ALL TRUCKS LEAVING THE SITE SHALL BE COVERED.
5. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSTITUTE EROSION CONTROL MEASURES ON AN AS NECESSARY BASIS, SUCH THAT EXCESSIVE SOIL EROSION DOES NOT OCCUR.
6. THE LOCATION OF UNDERGROUND UTILITIES AS REPRESENTED ON THESE PLANS IS BASED UPON PLANS AND INFORMATION PROVIDED BY THE RESPECTIVE UTILITY COMPANIES OR MUNICIPAL DEPARTMENTS SUPPLEMENTED BY FIELD IDENTIFICATION WHEREVER POSSIBLE. NO WARRANTY IS MADE AS TO THE ACCURACY OF THE LOCATION OF ANY UTILITIES. THE UNDERGROUND UTILITIES ARE SHOWN. THE CONTRACTOR SHALL CONTRACT DIG SAFE AT LEAST 72 HOURS PRIOR TO THE START OF CONSTRUCTION. DIG SAFE TELEPHONE NUMBER IS 1-800-322-4844.
7. THE CONTRACTOR SHALL VERIFY THE LOCATION, SIZE AND DEPTH OF EXISTING UTILITIES PRIOR TO TAPPING INTO, CROSSING OR EXTENDING THEM. IF THE NEW UTILITY HAS A CONFLICT WITH EXISTING UTILITIES, THE ENGINEER SHALL BE NOTIFIED PRIOR TO THE CONTRACTOR CONTINUING.
8. NO LEDGE, BOULDERS, OR OTHER UNYIELDING MATERIALS ARE TO BE LEFT WITHIN 6" OF THE WATER IN THE TRENCH, NOR ARE THEY TO BE USED FOR BACKFILL FOR THE FIRST 12" ABOVE THE PIPES.
9. PAVEMENT AREA SHALL BE PAVED TO A THICKNESS AS SHOWN ON THE PLANS MEASURED AFTER COMPACTION, WITH A BINDER COURSE AND TOP COURSE OF CLASS 1 BITUMINOUS CONCRETE PAVEMENT, TYPE I-1.
10. BASE MATERIAL SHALL BE CLEAN BANK RUN GRAVEL CONFORMING TO M.D.P.W. M1.03.1, WITH NO STONES LARGER THAN THREE (3) INCHES IN DIAMETER SHALL BE PLACED AND ROLLED WITH AT LEAST A TEN TON ROLLER. THE SURFACES SHALL BE WET DURING ROLLING TO BIND THE MATERIAL. ALL STONES OF 4" DIAMETER OR LARGER SHALL BE REMOVED FROM THE SUB-BASE PRIOR TO PLACING BASE MATERIAL.
11. ALL EXISTING PAVING TO BE DISTURBED SHALL BE CUT ALONG A STRAIGHT LINE THROUGH THE ENTIRE THICKNESS. BUTT THE NEW PAVING INTO THE EXISTING PAVEMENT TO REMAIN.
12. ANY PAVEMENT REMOVED FOR UTILITY TRENCH EXCAVATION OR OTHERWISE DISTURBED IN CONSTRUCTION SHALL BE REPLACED WITH A PAVEMENT SECTION CONSISTING OF 1" WEAR COURSE OVERLAYING A 1 1/2" BINDER COURSE OVERLAYING A 8" COMPACTED GRAVEL BASE COURSE.
13. THE CONTRACTOR SHALL APPLY FOR A STREET OPENING AND UTILITY CONNECTION PERMITS AND SIDEWALK CROSSING PERMIT WITH THE CITY OF SOMERVILLE DPW.
14. CONTRACTOR TO ENSURE THAT ALL SURFACE WATER IS DIVERTED AWAY FROM BUILDING FOUNDATION DURING FINAL GRADING.

1. INFORMATION SHOWN ON THIS PLAN IS THE RESULT OF A FIELD SURVEY PERFORMED BY PETER NOLAN & ASSOCIATES LLC AS OF 4/22/2021.
2. DEED REFERENCE: BOOK 1422, PAGE 137  
LC PLAN #3765--L  
MIDDLESEX COUNTY SOUTH DISTRICT REGISTRY OF DEEDS
3. THIS PLAN IS NOT INTENDED TO BE RECORDED.
4. I CERTIFY THAT THE DWELLING SHOWN IS MAPPED WITHIN OTHER FLOOD AREA ZONE X (I.E., 0.2 PERCENT ANNUAL CHANCE FLOOD); I FURTHER CERTIFY THAT THE SUBPARALLEL ADJACENT LOT WITHIN THE 100-YEAR FLOODPLAIN WITH 100-YEAR BASE FLOOD ELEVATION OF 7.0 FEET W/AD 1988 AS SHOWN ON FLOOD HAZARD BOUNDARY MAP NUMBER 25017C0419E, DATED JUNE 4, 2010, BASED UPON SITE SPECIFIC TOPOGRAPHY AT 1988, THE ENTIRE SITE IS LOCATED WITHIN THE 100-YEAR FLOOD ELEVATION OF 7.0 FEET WITH THE LOWEST ON-SITE ELEVATION SHOWN AS 8.39 FEET W/AD 1988.
5. THIS PLAN DOES NOT SHOW ANY UNRECORDED OR UNWRITTEN EASEMENTS, WHICH MAY EXIST, A REASONABLE AND DILIGENT ATTEMPT HAS BEEN MADE TO OBSERVE ANY APPARENT USES OF THE LAND; HOWEVER THIS NOT CONSTITUTE A GUARANTEE THAT NO SUCH EASEMENTS EXIST.
6. FIRST FLOOR ELEVATIONS ARE TAKEN AT THRESHOLD.
7. NO RESPONSIBILITY IS TAKEN FOR ZONING TABLE AS PETER NOLAN & ASSOCIATES LLC ARE NOT ZONING EXPERTS. TABLE IS/OKN FROM TABLE PROVIDED BY LOCAL ZONING ORDINANCE. CLIENT AND/OR ARCHITECT TO VERIFY THE ACCURACY OF ZONING ANALYSIS.
8. THE ELEVATIONS SHOWN ARE AT 1988 DATUM. CONVERSION TO 1988 W/AD 1988 WAS MADE AS FOLLOWS: THE SEWER MANHOLE (SMH) FROM SEWER ASSESSMENT PLAN #2312 HAS RIM ELEVATION OF 9.19 FEET ARLINGTON TOWN BASE. BOSTON BASE IS ARLINGTON TOWN BASE MINUS 5.54 FEET. 1988 IS 8.64 FEET.  
SMH RIM = 9.19 - 5.54 + 6.46 = 10.11 FEET W/AD 1988

## DRAINAGE AREA SUMMARY

EXISTING ROOF AREA = 1,012.7 S.F.	
EXISTING PAVED DRIVEWAYS = 445.5 S.F.	
EXISTING IMPERVIOUS (WALKWAYS/STEPS/LANDINGS) = 288.3 S.F.	
EXISTING LANDSCAPE AREA = 2,943.2 S.F.	
EXISTING ROOF AREA TO REMAIN = 951.0 S.F.	
PROPOSED ROOF AREA = 518.7 S.F.	
PROPOSED IMPERVIOUS (DECKS/CONCRETE PADS/STEPS/LANDINGS) = 408.0 S.F.	
PROPOSED PERMEABLE PAVERS AREA = 678.8 S.F.	
PROPOSED LANDSCAPE AREA = 2,133.2 S.F.	
TOTAL EXISTING IMPERVIOUS AREA = 1,746.5 S.F.	
TOTAL PROPOSED IMPERVIOUS AREA = 1,877.7 S.F.	
TOTAL INCREASE IN IMPERVIOUS AREA = 131.2 S.F.	

ESHGW © >80"  
REFER TO STORMWATER REPORT  
FOR NRCS SOIL SURVEY RESULTS.

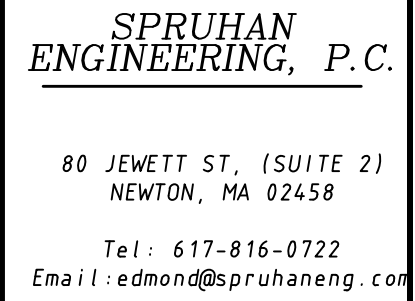
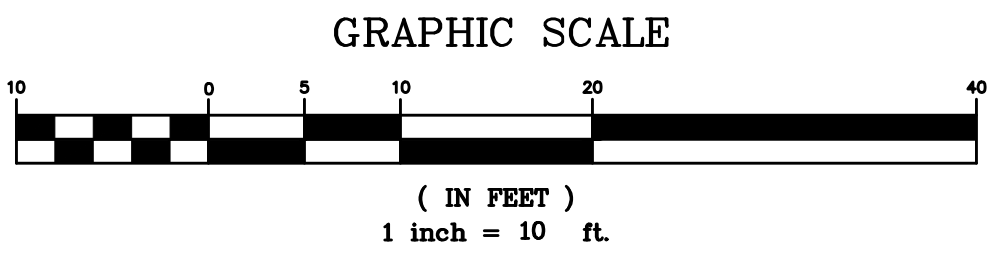
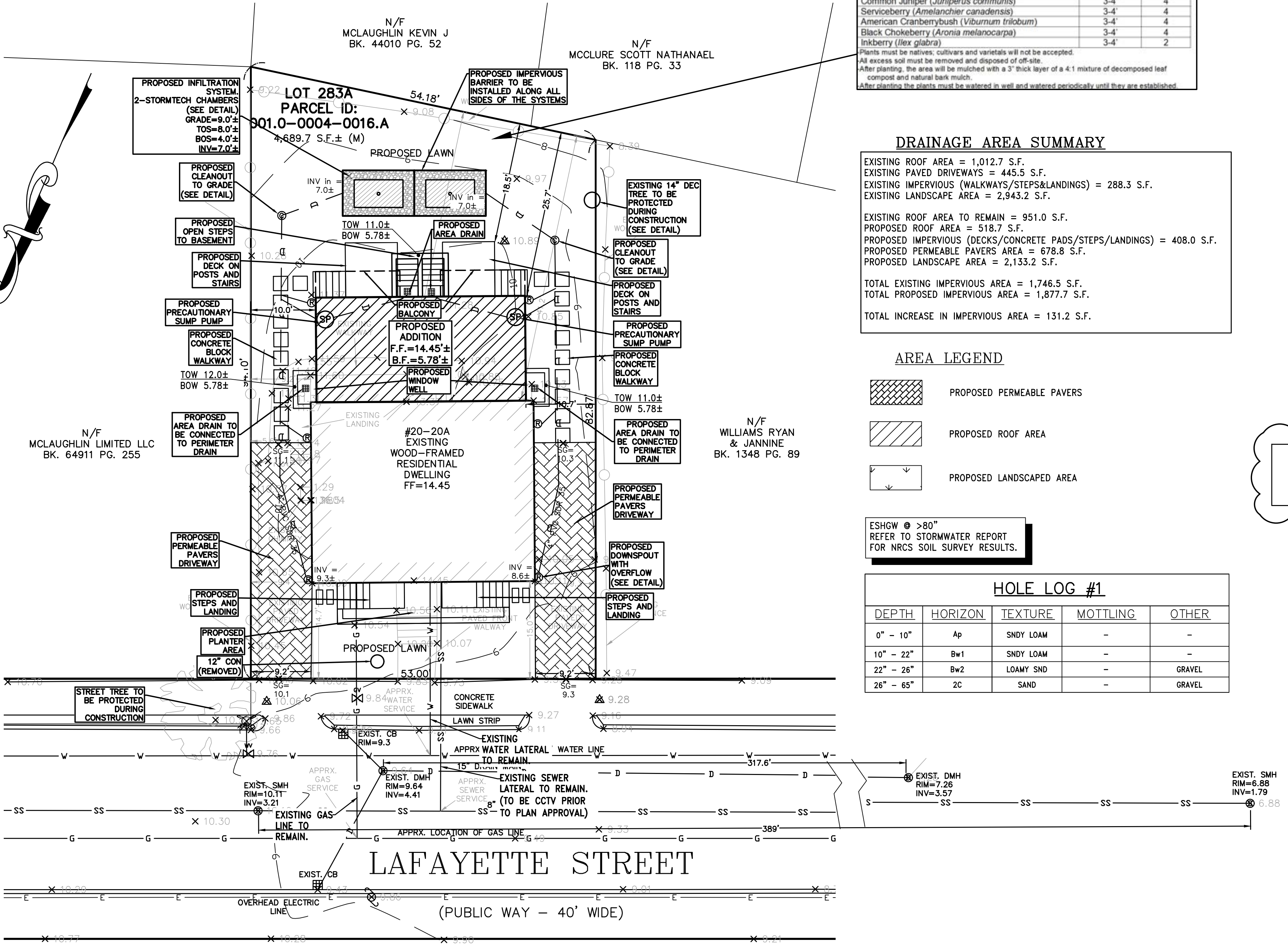
HOLE LOG #1				
DEPTH	HORIZON	TEXTURE	MOTTLING	OTHER
0" - 10"	Ap	SDNY LOAM	-	-
10" - 22"	Bw1	SDNY LOAM	-	-
22" - 26"	Bw2	LOAMY SND	-	GRAVEL
26" - 65"	2C	SAND	-	GRAVEL

REFER TO ARCHITECTURAL  
PLANS FOR ALL ZONING  
RELATED INFORMATION

ALL SURFACE WATER RUNOFF SHALL  
BE DIRECTED AWAY FROM BUILDING  
FOUNDATION AND AWAY FROM  
NEIGHBORING PROPERTY

PROPOSED FIRST FLOOR ELEVATION  
TO BE VERIFIED BY ARCHITECT  
PRIOR TO ANY CONCRETE BEING  
POURED.

\* PER TITLE V, SEWER FLOW RESIDENTIAL (G.P.D)  
 EXISTING = (6 BEDROOMS x 110 G.P.D.) = 660 G.P.D  
 PROPOSED = (8 BEDROOMS x 110 G.P.D.) = 880 G.P.D  
 THEREFORE, PROPOSED INCREASED FLOW = 220 G.P.D



20-20A LAFAYETTE ST,  
ARLINGTON,  
MASSACHUSETTS.

## REVISION BLOCK

[illegible]

All legal rights including, but not limited to, copyright and design patent rights, in the designs, arrangements and plans shown on this document are the property of Peter Nolan & Associates, LLC, or Spruhan Engineering, P.C. They may not be used or reused in whole or in part, except in connection with this project, without the prior written consent of Spruhan Engineering, P.C.. Written dimensions on these drawings shall have precedence over scaled dimensions. Contractors shall verify and be responsible for all dimensions and conditions on this project, and Spruhan Engineering, P.C., must be notified of any variation from the dimensions and conditions shown by these drawings.

DATE:	3/30/2022
DRAWN BY:	G.P
CHECKED BY:	E.S
APPROVED BY:	P.N

*SHEET 1 OF 3*



### EROSION CONTROL NOTES

- THE EROSION CONTROL PLANS IN THIS SET SHALL BE REVIEWED AND IMPLEMENTED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR SHALL WORK WITH THE PROJECT'S ENGINEER THROUGHOUT CONSTRUCTION TO ENSURE THE SITE IS PROPERLY PROTECTED FROM POSSIBLE POLLUTANTS. THE ENGINEER HAS AUTHORIZATION TO ADD OR REMOVE BMP MEASURES THROUGHOUT CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING SITE EROSION CONTROL AT ALL TIMES.
- IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND THE PERMITTEE TO ENSURE THAT EROSION DOES NOT OCCUR FROM ANY ACTIVITY DURING OR AFTER PROJECT CONSTRUCTION. ADDITIONAL MEASURES, BEYOND THOSE SPECIFIED, MAY BE REQUIRED BY THE PLANNING DIRECTOR AS DEEMED NECESSARY TO CONTROL ACCELERATED EROSION.
- AT THE END OF EACH WORKDAY, AT THE END OF EACH WORKWEEK, THE CONTRACTOR SHALL IMPLEMENT ALL TEMPORARY MEASURES NECESSARY TO PREVENT EROSION AND SILTATION, UNTIL THE PROJECT HAS BEEN FINALIZED. THESE MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, DIRECT SEEDING OF THE AFFECTED AREAS, STRAW MULCHING, AND/OR INSTALLATION OF STRAW BALES DAMS/SILT FENCES.
- DURING CONSTRUCTION, NO TURBID WATER SHALL BE PERMITTED TO LEAVE THE SITE. USE OF SILT AND GREASE TRAPS, FILTER BERMS, STRAW BALES OR SILT FENCES SHALL BE USED TO PREVENT SUCH DISCHARGE.
- ALL AREAS ON- AND OFF-SITE EXPOSED DURING CONSTRUCTION ACTIVITIES, IF NOT PERMANENTLY LANDSCAPED PER PLAN, SHALL BE PROTECTED BY MULCHING AND/OR SEEDING.
- ALL EXCAVATED MATERIAL SHALL BE REMOVED TO AN APPROVED DISPOSAL SITE OR DISPOSED OF ON-SITE IN A MANNER THAT WILL NOT CAUSE EROSION.
- ANY MATERIAL STOCKPILED, FOR LONGER THAN 14 DAYS, DURING CONSTRUCTION SHALL BE COVERED WITH PLASTIC.
- UPON COMPLETION OF CONSTRUCTION, ALL REMAINING EXPOSED SOILS SHALL BE PERMANENTLY REVEGETATED.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ADDITIONAL MEASURES NECESSARY TO CONTROL SITE EROSION AND PREVENT SEDIMENT TRANSPORT OFF-SITE ARE IMPLEMENTED.
- ALL SPILLS AND/OR LEAKS SHALL BE IMMEDIATELY CLEANED UP AND MITIGATED.

## CONSTRUCTION MATERIALS

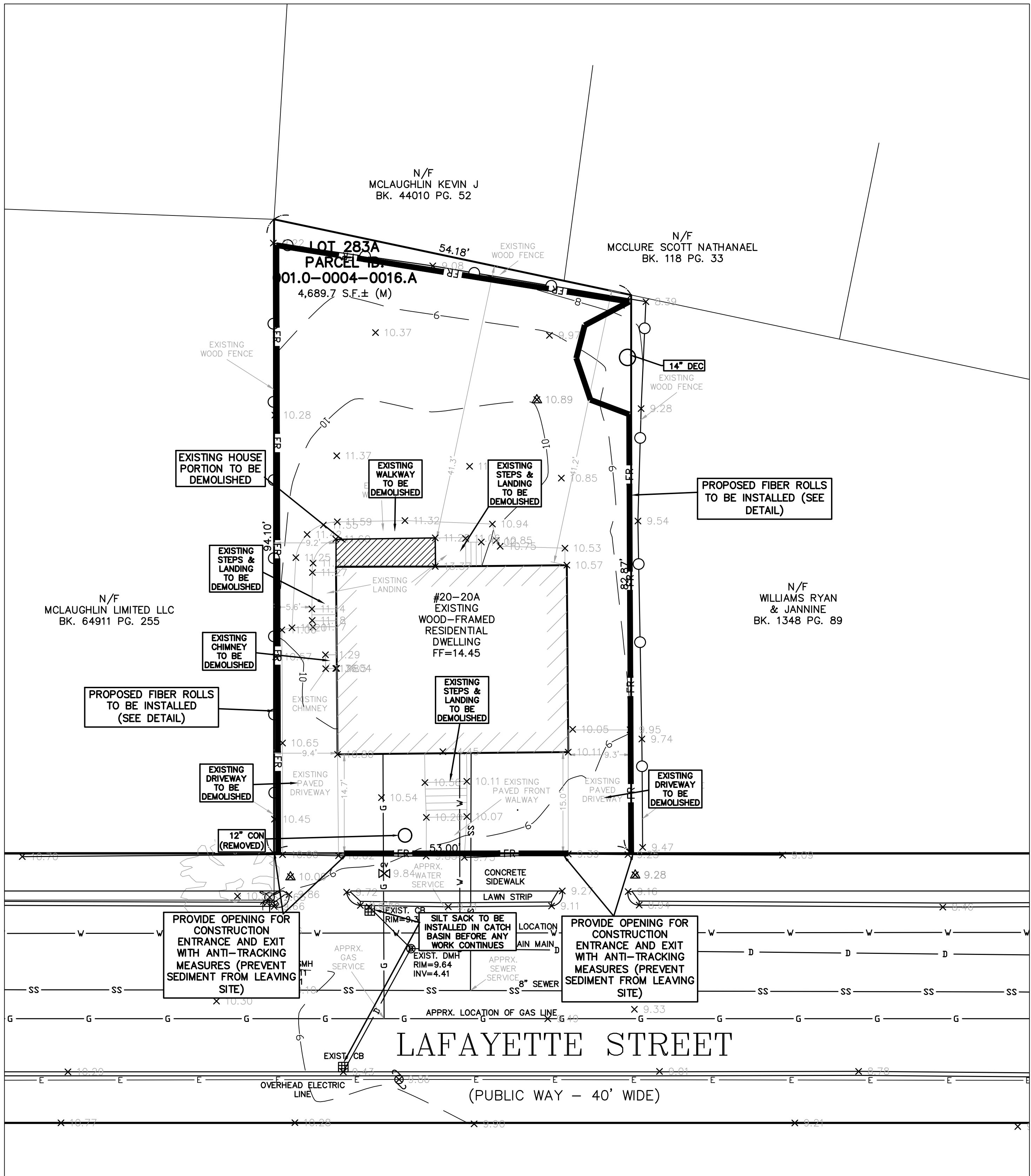
- ALL LOOSE STOCKPILED CONSTRUCTION MATERIALS THAT ARE NOT ACTIVELY BEING USED (I.E. SOIL, SPOILS, AGGREGATE, FLY-ASH, STUCCO, HYDRATED LIME, ETC.) SHALL BE COVERED AND BERMED.
- ALL CHEMICALS SHALL BE STORED IN WATERTIGHT CONTAINERS (WITH APPROPRIATE SECONDARY CONTAINMENT TO PREVENT ANY SPILLAGE OR LEAKAGE) OR IN A STORAGE SHED (COMPLETELY ENCLOSED).
- EXPOSURE OF CONSTRUCTION MATERIALS TO PRECIPITATION SHALL BE MINIMIZED. OUTDOORS AND EXPOSED CONSTRUCTION MATERIALS AND EQUIPMENT SHALL BE DESIGNED TO BE OUTDOORS AND EXPOSED TO ENVIRONMENTAL CONDITIONS (I.E. POLES, EQUIPMENT PADS, CABINETS, CONDUCTORS, INSULATORS, BRICKS, ETC.).
- BEST MANAGEMENT PRACTICES TO PREVENT THE OFF-SITE TRACKING OF LOOSE CONSTRUCTION AND LANDSCAPE MATERIALS SHALL BE IMPLEMENTED.

## WASTE MANAGEMENT

- DISPOSAL OF ANY RINSE OR WASH WATERS OR MATERIALS ON IMPERVIOUS OR PERVIOUS SITE SURFACES OR INTO THE STORM DRAIN SYSTEM SHALL BE PREVENTED.
- SANITATION FACILITIES SHALL BE CONTAINED (E.G. PORTABLE TOILETS) TO PREVENT DISCHARGES OF POLLUTANTS TO THE STORM WATER DRAINAGE SYSTEM OR RECEIVING WATER, AND SHALL BE LOCATED A MINIMUM 20 FEET AWAY FROM AN INLET, STREET OR DRIVEWAY, STREAM, RIPARIAN AREA OR OTHER DRAINAGE FACILITY.
- SANITATION FACILITIES SHALL BE INSPECTED REGULARLY FOR LEAKS AND SPILLS AND CLEANED OR REPLACED AS NECESSARY.
- COVER WASTE DISPOSAL CONTAINERS AT THE END OF EVERY BUSINESS DAY AND DURING A RAIN EVENT.
- DISCHARGES FROM WASTE DISPOSAL CONTAINERS TO THE STORM WATER DRAINAGE SYSTEM OR RECEIVING WATER SHALL BE PREVENTED.
- STOCKPILED WASTE MATERIAL SHALL BE CONTAINED AND SECURELY PROTECTED FROM WIND AND RAIN AT ALL TIMES UNLESS ACTIVELY BEING USED.

PROCEDURES THAT EFFECTIVELY ADDRESS HAZARDOUS AND NON-HAZARDOUS SPILLS SHALL BE IMPLEMENTED. EQUIPMENT AND MATERIALS FOR CLEANUP OF SPILLS SHALL BE AVAILABLE ON SITE AND THAT SPILLS AND LEAKS SHALL BE CLEANED UP IMMEDIATELY AND DISPOSED OF PROPERLY; AND

- CONCRETE WASHOUT AREAS AND OTHER WASHOUT AREAS THAT MAY CONTAIN ADDITIONAL POLLUTANTS SHALL BE CONTAINED SO THERE IS NO DISCHARGE INTO THE UNDERLYING SOIL AND ONTO THE SURROUNDING AREAS.

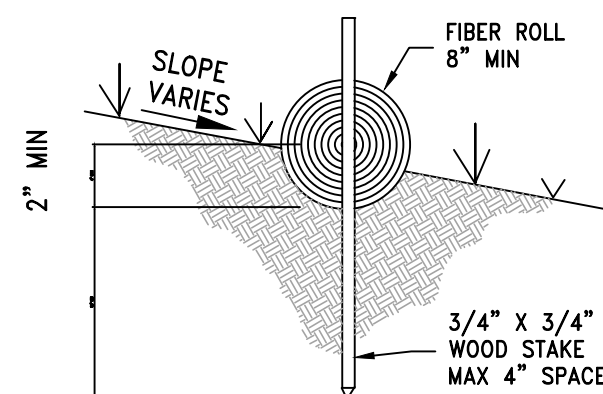


### VEHICLE STORAGE AND MAINTENANCE

- MEASURES SHALL BE TAKEN TO PREVENT OIL, GREASE, OR FUEL TO LEAK IN TO THE GROUND, STORM DRAINS OR SURFACE WATERS.
- ALL EQUIPMENT OR VEHICLES, WHICH ARE TO BE FUELED, MAINTAINED AND STORED ONSITE SHALL BE IN A DESIGNATED AREA FITTED WITH APPROPRIATE BMPs.
- LEAKS SHALL BE IMMEDIATELY CLEANED AND LEAKED MATERIALS SHALL BE DISPOSED OF PROPERLY.

## LANDSCAPE MATERIALS

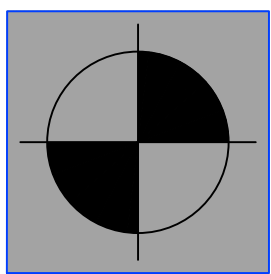
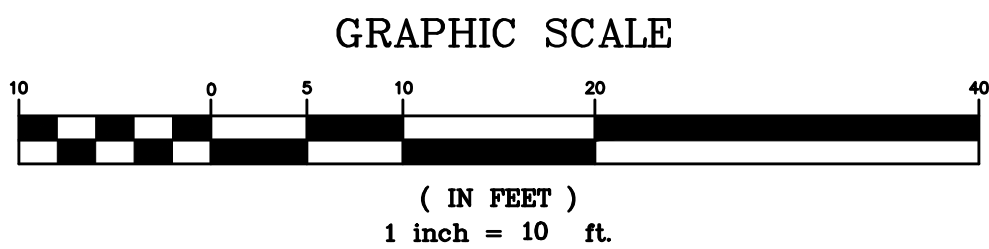
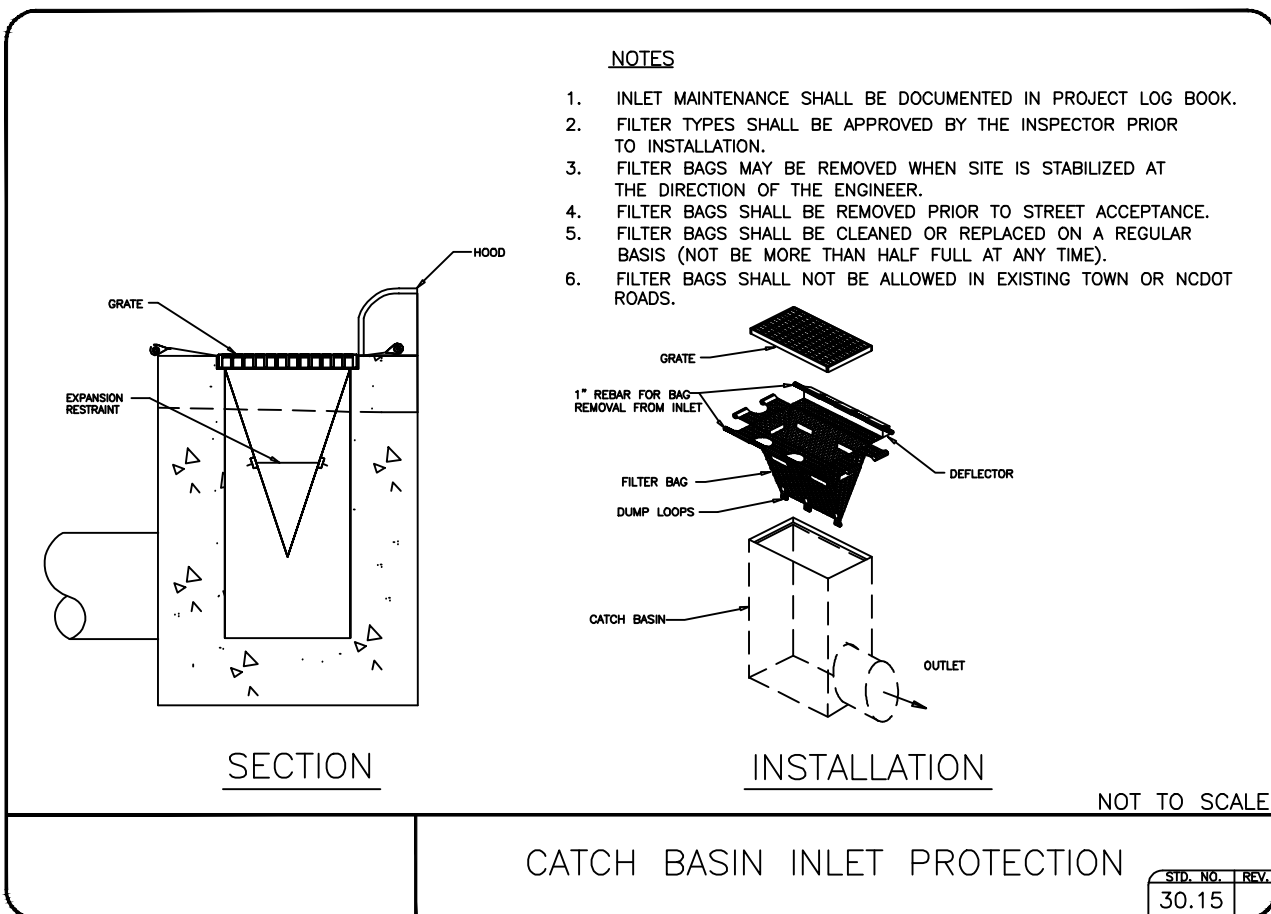
- CONTAIN STOCKPILED MATERIALS SUCH AS MULCHES AND TOPSOIL WHEN THEY ARE NOT ACTIVELY BEING USED
- CONTAIN FERTILIZERS AND OTHER LANDSCAPE MATERIALS WHEN THEY ARE NOT ACTIVELY BEING USED.
- DISCONTINUE THE APPLICATION OF ANY ERODIBLE LANDSCAPE MATERIAL WITHIN 2 DAYS BEFORE A FORECASTED RAIN EVENT OR DURING PERIODS OF PRECIPITATION.
- APPLY ERODIBLE LANDSCAPE MATERIAL AT QUANTITIES AND APPLICATION RATES ACCORDING TO MANUFACTURE RECOMMENDATIONS OR BASED ON WRITTEN SPECIFICATIONS BY KNOWLEDGEABLE AND EXPERIENCED FIELD PERSONNEL.
- STACK ERODIBLE LANDSCAPE MATERIAL ON PALLETS AND COVERING OR STORING SUCH MATERIALS WHEN NOT BEING USED OR APPLIED.



### ENTRENCHMENT DETAIL

FIBER ROLLS  
NTS

**FR FIBER ROLLS**



PETER NOLAN &  
ASSOCIATES, LLC

LAND SURVEYORS/CIVIL  
ENGINEERING CONSULTANTS  
80 JEWETT ST, (SUITE 2)  
NEWTON, MA 02458  
  
Tel: 857-891-7478  
617-782-1533  
Fax: 617-2025691



SPRUHAN  
ENGINEERING, P.C

80 JEWETT ST, (SUITE 2)  
NEWTON, MA 02458  
Tel: 617-816-0722  
Email: [edmond@spruhaneng.com](mailto:edmond@spruhaneng.com)



20-20A LAFAYETTE ST,  
ARLINGTON,  
MASSACHUSETTS.

## CIVIL PLAN

## REVISION BLOCK

[illegible]

All legal rights including, but not limited to, copyright and design patent rights, in the designs, arrangements and plans shown on this document are the property of Peter Nolan & Associates, LLC, or Spruhan Engineering, P.C. They may not be used or reused in whole or in part, except in connection with this project, without the prior written consent of Spruhan Engineering, P.C.. Written dimensions on these drawings shall have precedence over scaled dimensions. Contractors shall verify and be responsible for all dimensions and conditions on this project, and Spruhan Engineering, P.C., must be notified of any variation from the dimensions and conditions shown by these drawings.

DATE:	3/30/2022
DRAWN BY:	G.P
CHECKED BY:	E.S
APPROVED BY:	P.N

## EROSION CONTROL & DEMOLITION PLAN

*SHEET 3 OF 3*

SPRUHAN ENGINEERING, P.C.

# STORMWATER REPORT

20-20A LAFAYETTE ST, ARLINGTON, MA



**Prepared By: Spruhan Engineering, P.C.**

## Contents

---

<b>1.0</b>	<b>Introduction.....</b>	<b>3</b>
<b>2.0</b>	<b>Existing Conditions.....</b>	<b>3</b>
<b>2.1</b>	<b>Existing Topography and Drainage Infrastructure.....</b>	<b>3</b>
<b>3.0</b>	<b>Proposed Conditions.....</b>	<b>4</b>
<b>3.1</b>	<b>Project Description.....</b>	<b>4</b>
<b>3.2</b>	<b>Storm Water Runoff .....</b>	<b>4</b>
<b>3.3</b>	<b>Infiltration system .....</b>	<b>4</b>
<b>4.0</b>	<b>Soil Information .....</b>	<b>5</b>
	<b>Appendix A – HydroCAD Calculations .....</b>	<b>7</b>
	<b>Appendix B – Soils Information .....</b>	<b>67</b>

## **1.0 Introduction**

---

Spruhan Engineering, P.C. has prepared this Storm water Report for the proposed development located at 20-20A Lafayette St, Arlington, Massachusetts.

The proposed development consists of an addition to the existing dwelling, two permeable pavers driveways, two rear decks and landscaped areas. The purpose of this report is to demonstrate that the proposed conditions do not create any increased flowrate or runoff from the site. This is achieved by installing an infiltration system.

## **2.0 Existing Conditions**

---

The existing property is located at 20-20A Lafayette St, Arlington, Massachusetts. The site is bounded by residential dwellings on the rear and sides. The property is located in Lafayette St Between Massachusetts Ave and Boulevard Rd. The existing roof area on the lot is 1012.7 S.F., the existing paved area is 445.5 S.F., the existing impervious areas are 288.3 S.F. and the existing landscaped area on the lot is 2,943.2 S.F.

### **2.1 Existing Topography and Drainage Infrastructure.**

In general, the property slopes from the West to the East of the lot ranging between approximately 2.5%. As there is no drainage system currently installed, all storm water scours across the surface at grade.

### 3.0 Proposed Conditions

---

#### 3.1 Project Description

The development consists of an addition to the existing dwelling, two permeable pavers driveways, two rear decks and landscaped areas. The total existing and proposed roof will have an area of 1,469.7 S.F, the proposed permeable pavers driveways will have an area of 678.8 S.F., the unconnected impervious will have an area of 408.0 S.F. and the remaining landscaped portion will have a footprint of 2,133.2 S.F.

#### 3.2 Storm Water Runoff

HydroCAD was used to model the site for the existing and proposed conditions for the 2-year, 10-year, 25-year, and 100-year type III storm events based on Atlas-14 Rain information for Middlesex County Central Area. HydroCAD calculations can be seen in Appendix A. The following table shows a summary of the existing and proposed conditions on the site as they relate to flowrate and volume of storm water runoff for each of the storm events.

#### 3.3 Infiltration system

An infiltration system was proposed to control the runoff rate from the post construction site. This system consists of a total of 2 Stormtech plastic chambers with 1 ft of crushed stone bed below. The system is 7 ft x 22 ft x 4 ft.

	<b><u>Summary Table</u></b>			
	Runoff Flow Rate		Volume of Runoff	
	EXISTING	PROPOSED	EXISTING	PROPOSED
2 Year Storm	0.13 cfs	0.05 cfs	468 cf	225 cf
10 Year Storm	0.21 cfs	0.09 cfs	779 cf	420 cf
25 Year Storm	0.27 cfs	0.12 cfs	973 cf	546 cf
100 Year Storm	0.35 cfs	0.17 cfs	1,234 cf	717 cf

---

## 4.0 Soil Information

---

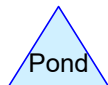
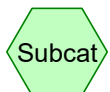
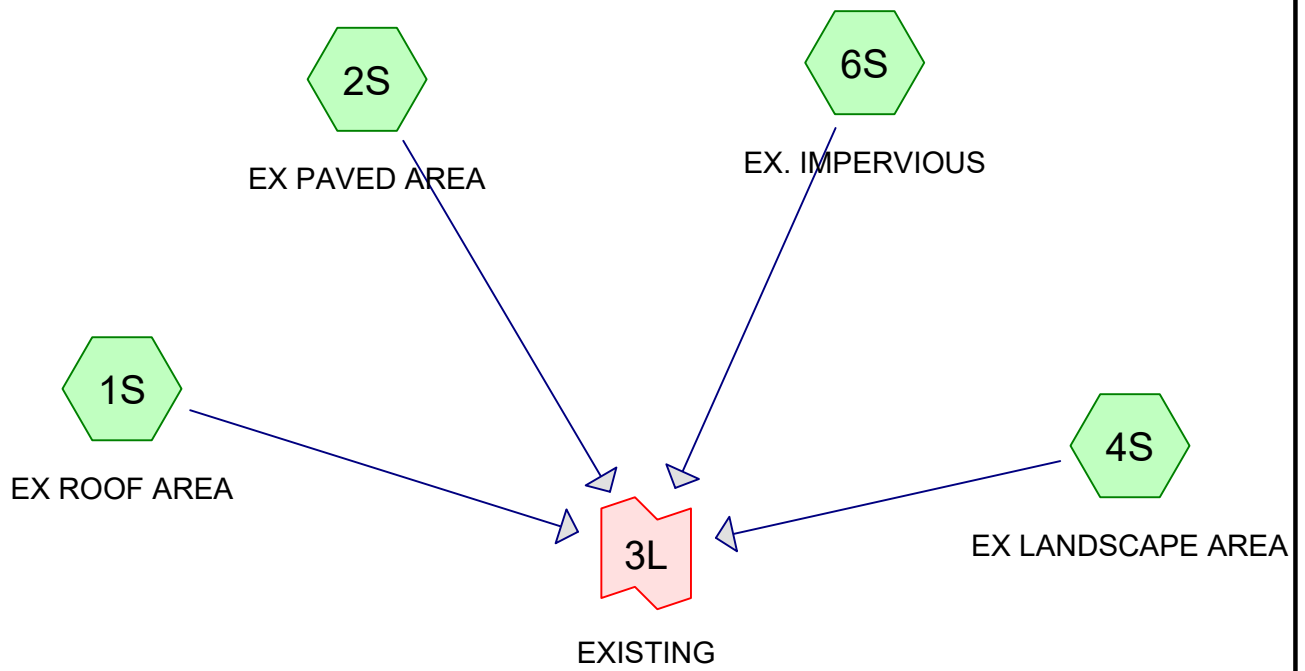
The NRCS Web Soil Survey shows one Map Unit inside our area of interest. These are listed next and the percentages of Area of Interest in the Map unit Legend Table:

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	0.2	100.0%
Totals for Area of Interest		0.2	100.0%

Map unit 626 B shows Hydrological group A, these properties were used on the HydroCAD model.

This information is shown in Appendix B, in the Map unit descriptions.

## **Appendix A – HydroCAD Calculations**



#### Routing Diagram for EXISTING

Prepared by SPRUHAN ENGINEERING P.E., Printed 3/23/2022  
HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

## EXISTING

Prepared by SPRUHAN ENGINEERING P.E.

Printed 3/23/2022

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Page 2

### Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
2,943	49	50-75% Grass cover, Fair, HSG A (4S)
446	98	Paved parking, HSG A (2S)
1,013	98	Roofs, HSG A (1S)
288	98	Unconnected pavement, HSG A (6S)
<b>4,690</b>	<b>67</b>	<b>TOTAL AREA</b>

## EXISTING

Prepared by SPRUHAN ENGINEERING P.E.

Printed 3/23/2022

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Page 3

### Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
4,690	HSG A	1S, 2S, 4S, 6S
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
<b>4,690</b>		<b>TOTAL AREA</b>

**EXISTING***Type III 24-hr 2-Year Rainfall=3.25"*

Prepared by SPRUHAN ENGINEERING P.E.

Printed 3/23/2022

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Page 4

Time span=0.00-30.00 hrs, dt=0.03 hrs, 1001 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: EX ROOF AREA**      Runoff Area=1,013 sf   100.00% Impervious   Runoff Depth=3.02"  
Tc=5.0 min   CN=98   Runoff=0.08 cfs   255 cf

**Subcatchment 2S: EX PAVED AREA**      Runoff Area=446 sf   100.00% Impervious   Runoff Depth=3.02"  
Tc=5.0 min   CN=98   Runoff=0.03 cfs   112 cf

**Subcatchment 4S: EX LANDSCAPE AREA**      Runoff Area=2,943 sf   0.00% Impervious   Runoff Depth=0.12"  
Tc=5.0 min   CN=49   Runoff=0.00 cfs   29 cf

**Subcatchment 6S: EX. IMPERVIOUS**      Runoff Area=288 sf   100.00% Impervious   Runoff Depth=3.02"  
Tc=5.0 min   CN=98   Runoff=0.02 cfs   72 cf

**Link 3L: EXISTING**

Inflow=0.13 cfs   468 cf  
Primary=0.13 cfs   468 cf

**Total Runoff Area = 4,690 sf   Runoff Volume = 468 cf   Average Runoff Depth = 1.20"**  
**62.75% Pervious = 2,943 sf   37.25% Impervious = 1,747 sf**

**EXISTING**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.25"

Printed 3/23/2022

Page 5

**Summary for Subcatchment 1S: EX ROOF AREA**

Runoff = 0.08 cfs @ 12.07 hrs, Volume= 255 cf, Depth= 3.02"

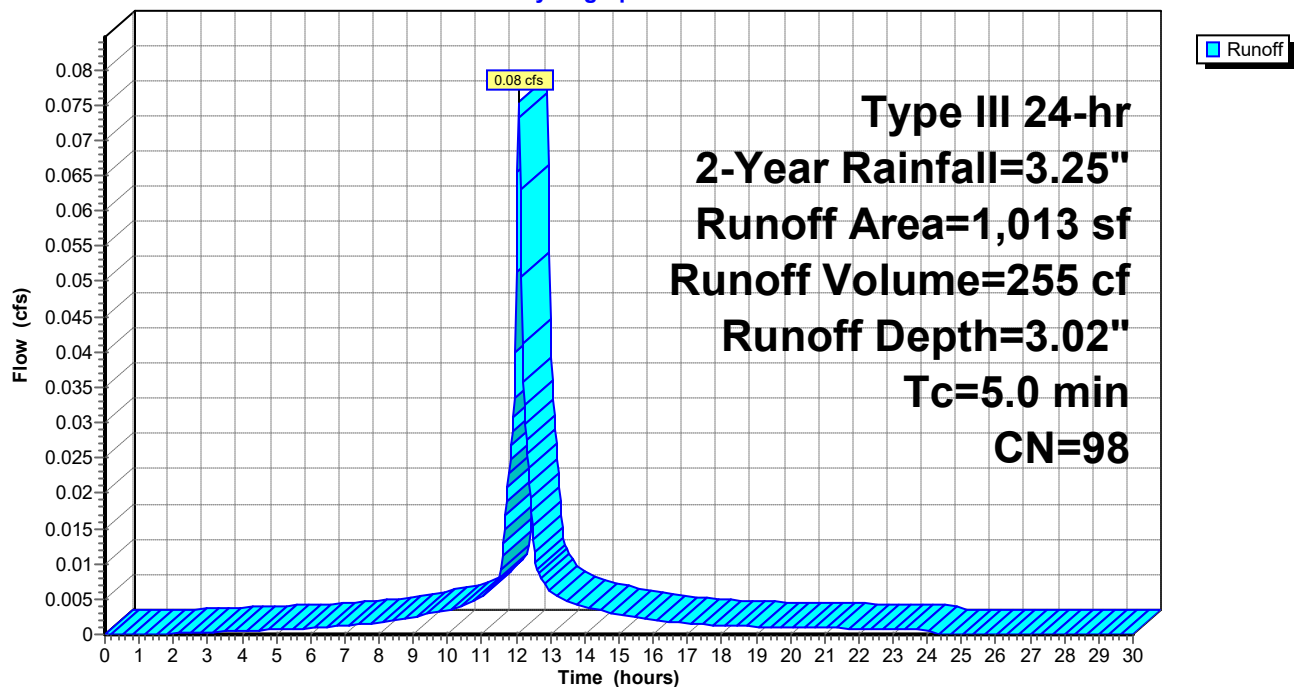
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2-Year Rainfall=3.25"

Area (sf)	CN	Description
1,013	98	Roofs, HSG A
1,013		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 1S: EX ROOF AREA**

Hydrograph



**EXISTING**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.25"

Printed 3/23/2022

Page 6

**Summary for Subcatchment 2S: EX PAVED AREA**

Runoff = 0.03 cfs @ 12.07 hrs, Volume= 112 cf, Depth= 3.02"

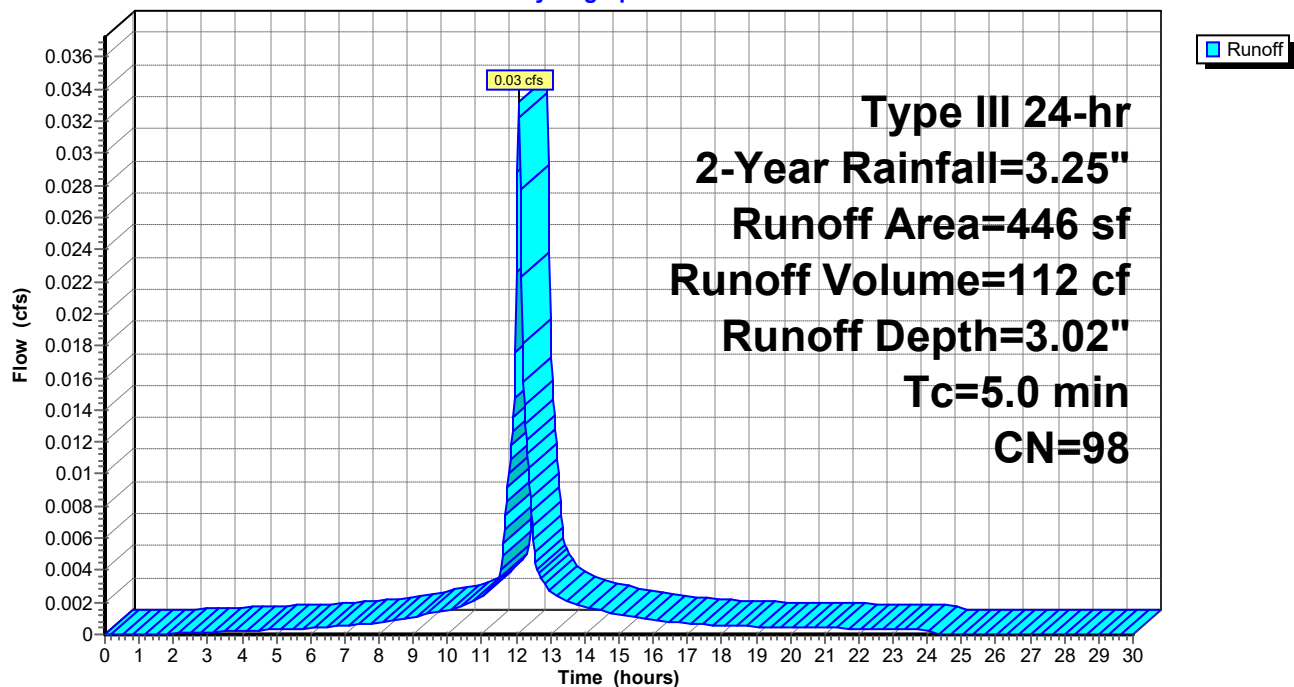
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2-Year Rainfall=3.25"

Area (sf)	CN	Description
446	98	Paved parking, HSG A
446		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 2S: EX PAVED AREA**

Hydrograph



**EXISTING**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.25"

Printed 3/23/2022

Page 7

**Summary for Subcatchment 4S: EX LANDSCAPE AREA**

Runoff = 0.00 cfs @ 12.48 hrs, Volume= 29 cf, Depth= 0.12"

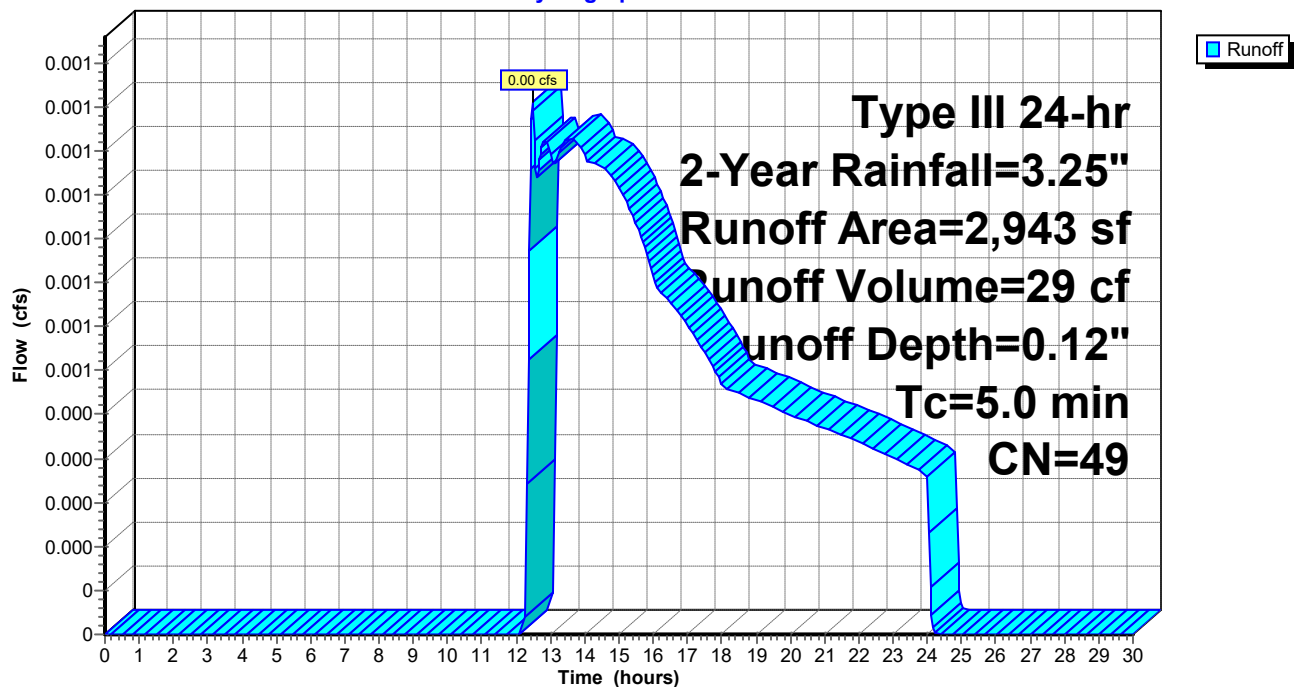
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2-Year Rainfall=3.25"

Area (sf)	CN	Description
2,943	49	50-75% Grass cover, Fair, HSG A
2,943		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 4S: EX LANDSCAPE AREA**

Hydrograph



**EXISTING**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.25"

Printed 3/23/2022

Page 8

**Summary for Subcatchment 6S: EX. IMPERVIOUS**

Runoff = 0.02 cfs @ 12.07 hrs, Volume= 72 cf, Depth= 3.02"

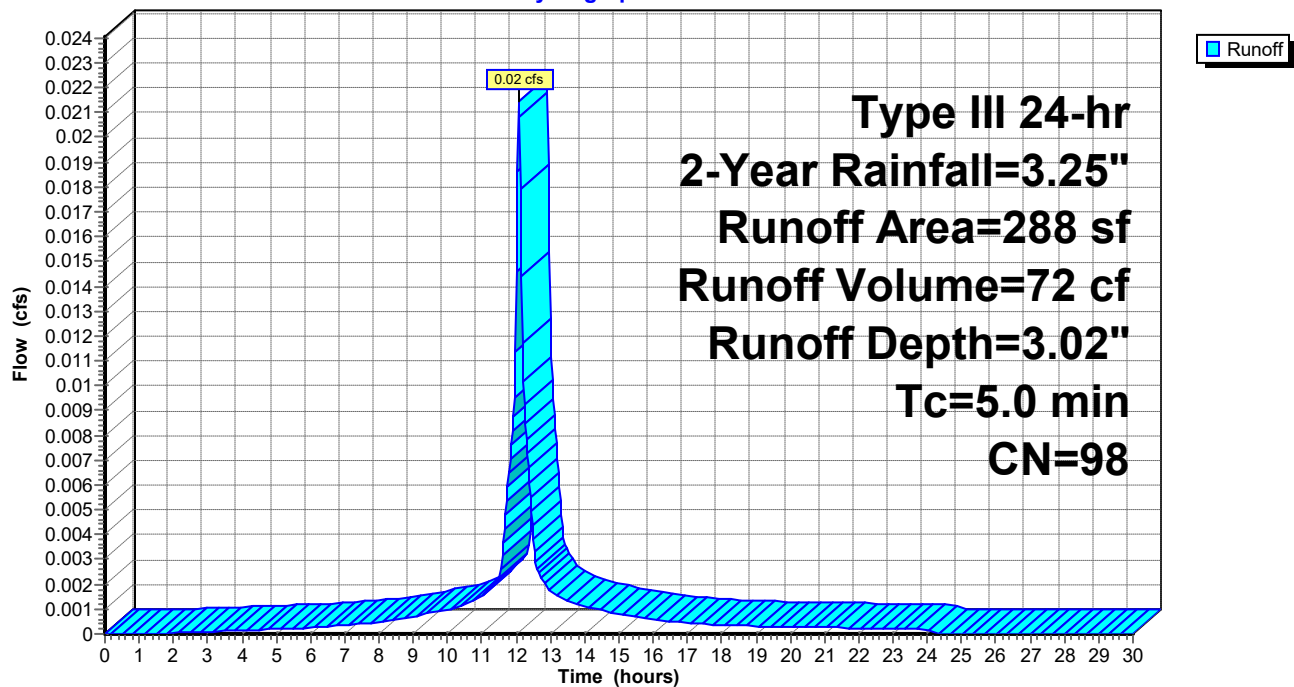
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2-Year Rainfall=3.25"

Area (sf)	CN	Description
288	98	Unconnected pavement, HSG A
288		100.00% Impervious Area
288		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 6S: EX. IMPERVIOUS**

Hydrograph



## EXISTING

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.25"

Printed 3/23/2022

Page 9

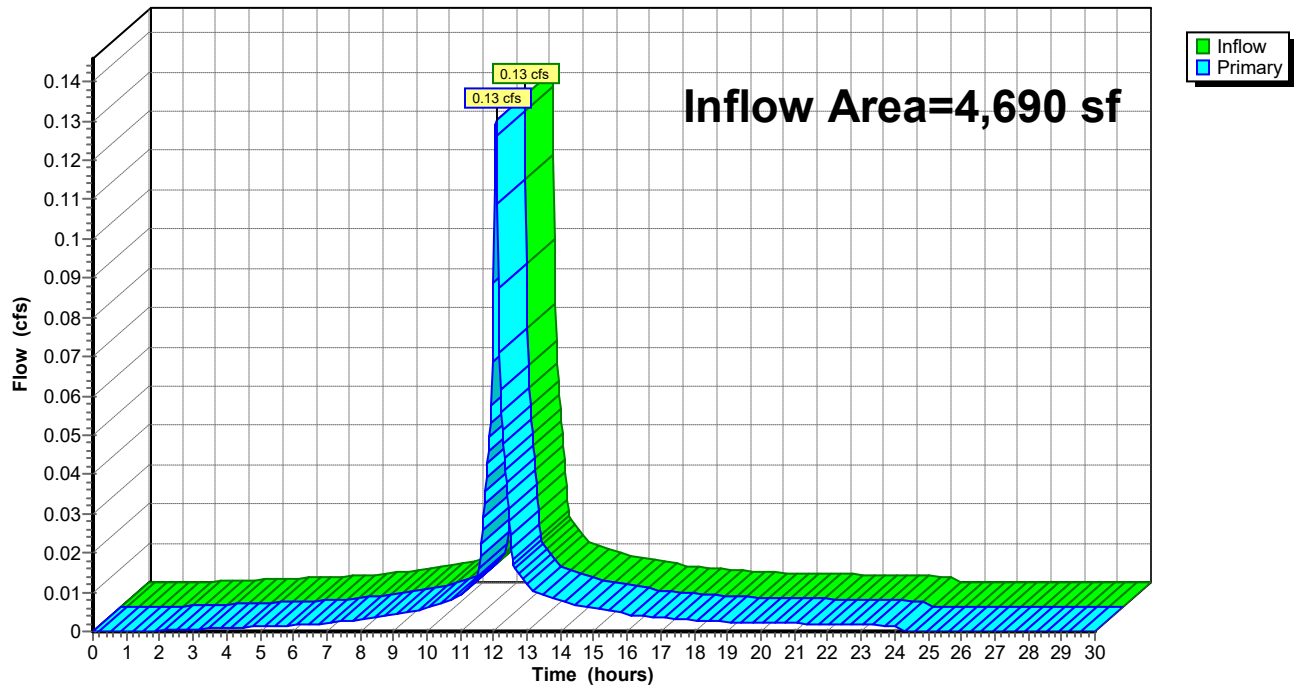
### Summary for Link 3L: EXISTING

Inflow Area = 4,690 sf, 37.25% Impervious, Inflow Depth = 1.20" for 2-Year event  
Inflow = 0.13 cfs @ 12.07 hrs, Volume= 468 cf  
Primary = 0.13 cfs @ 12.07 hrs, Volume= 468 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs

### Link 3L: EXISTING

Hydrograph



**EXISTING***Type III 24-hr 10-Year Rainfall=4.70"*

Prepared by SPRUHAN ENGINEERING P.E.

Printed 3/23/2022

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Page 10

Time span=0.00-30.00 hrs, dt=0.03 hrs, 1001 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: EX ROOF AREA**      Runoff Area=1,013 sf   100.00% Impervious   Runoff Depth=4.46"  
Tc=5.0 min   CN=98   Runoff=0.11 cfs   377 cf

**Subcatchment 2S: EX PAVED AREA**      Runoff Area=446 sf   100.00% Impervious   Runoff Depth=4.46"  
Tc=5.0 min   CN=98   Runoff=0.05 cfs   166 cf

**Subcatchment 4S: EX LANDSCAPE AREA**      Runoff Area=2,943 sf   0.00% Impervious   Runoff Depth=0.53"  
Tc=5.0 min   CN=49   Runoff=0.02 cfs   129 cf

**Subcatchment 6S: EX. IMPERVIOUS**      Runoff Area=288 sf   100.00% Impervious   Runoff Depth=4.46"  
Tc=5.0 min   CN=98   Runoff=0.03 cfs   107 cf

**Link 3L: EXISTING**

Inflow=0.21 cfs   779 cf  
Primary=0.21 cfs   779 cf

**Total Runoff Area = 4,690 sf   Runoff Volume = 779 cf   Average Runoff Depth = 1.99"**  
**62.75% Pervious = 2,943 sf   37.25% Impervious = 1,747 sf**

**EXISTING**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 10-Year Rainfall=4.70"

Printed 3/23/2022

Page 11

**Summary for Subcatchment 1S: EX ROOF AREA**

Runoff = 0.11 cfs @ 12.07 hrs, Volume= 377 cf, Depth= 4.46"

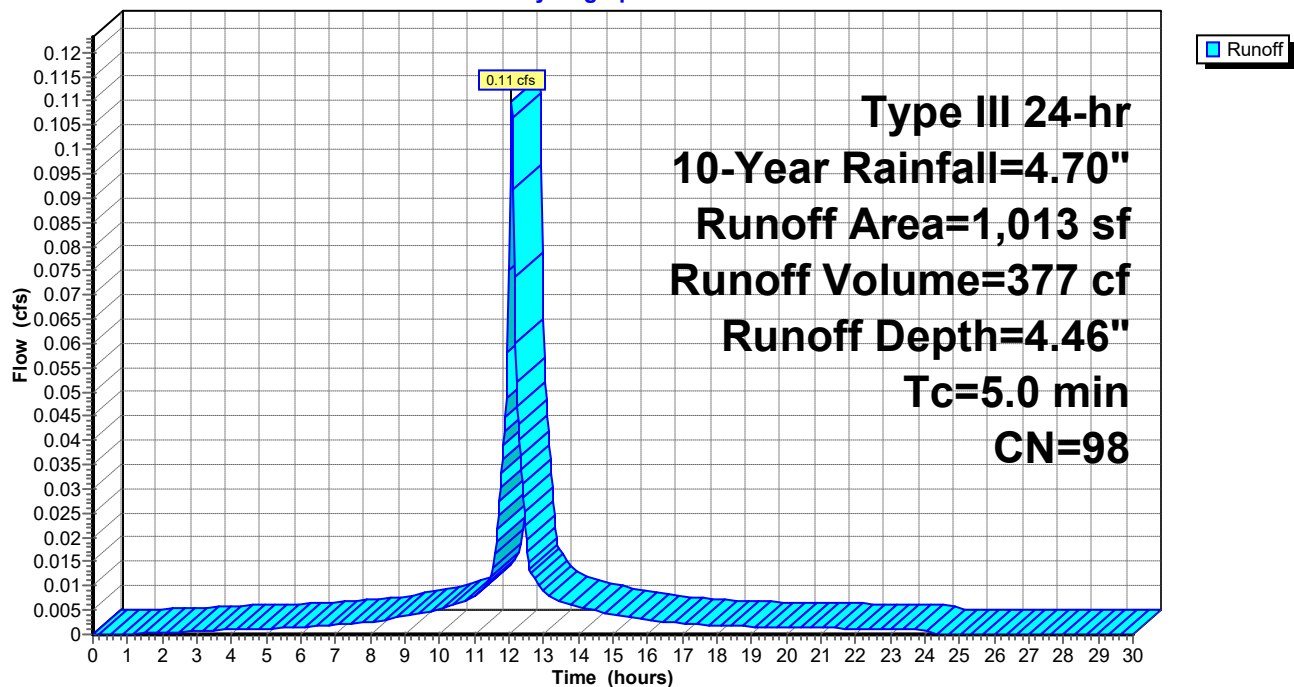
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
1,013	98	Roofs, HSG A
1,013		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 1S: EX ROOF AREA**

Hydrograph



**EXISTING**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 10-Year Rainfall=4.70"

Printed 3/23/2022

Page 12

**Summary for Subcatchment 2S: EX PAVED AREA**

Runoff = 0.05 cfs @ 12.07 hrs, Volume= 166 cf, Depth= 4.46"

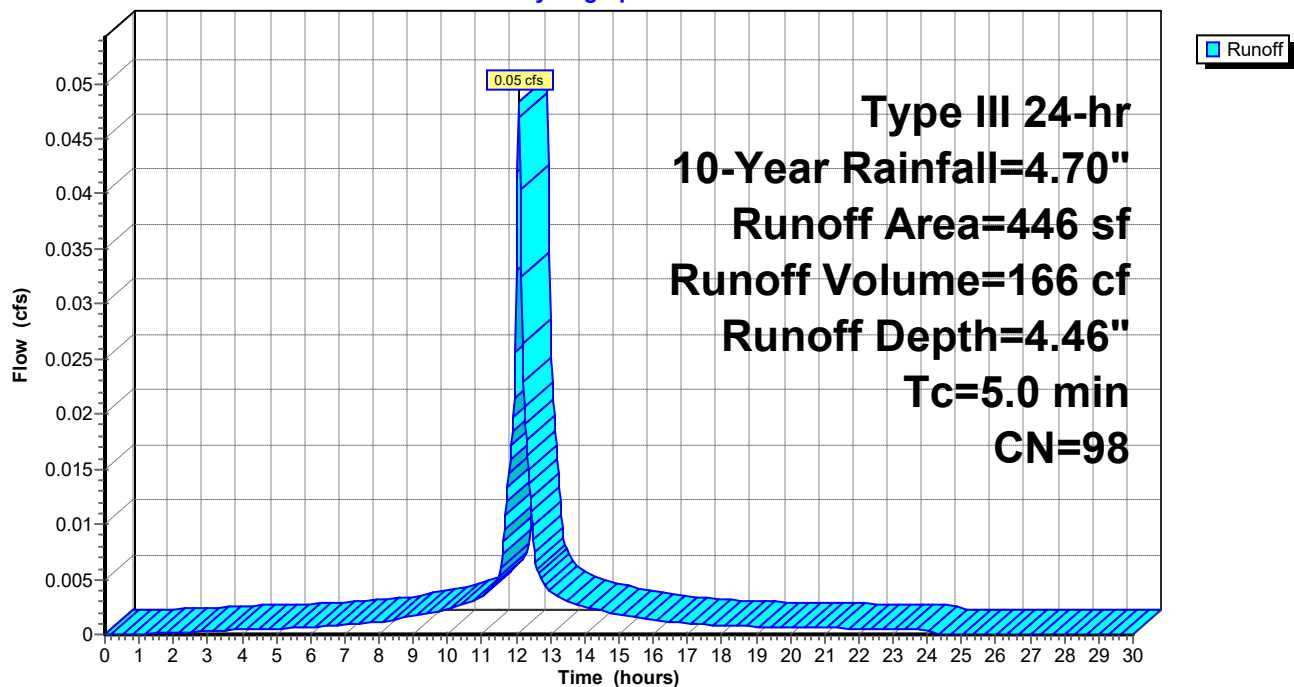
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
446	98	Paved parking, HSG A
446		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 2S: EX PAVED AREA**

Hydrograph



**EXISTING**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 10-Year Rainfall=4.70"

Printed 3/23/2022

Page 13

**Summary for Subcatchment 4S: EX LANDSCAPE AREA**

Runoff = 0.02 cfs @ 12.13 hrs, Volume= 129 cf, Depth= 0.53"

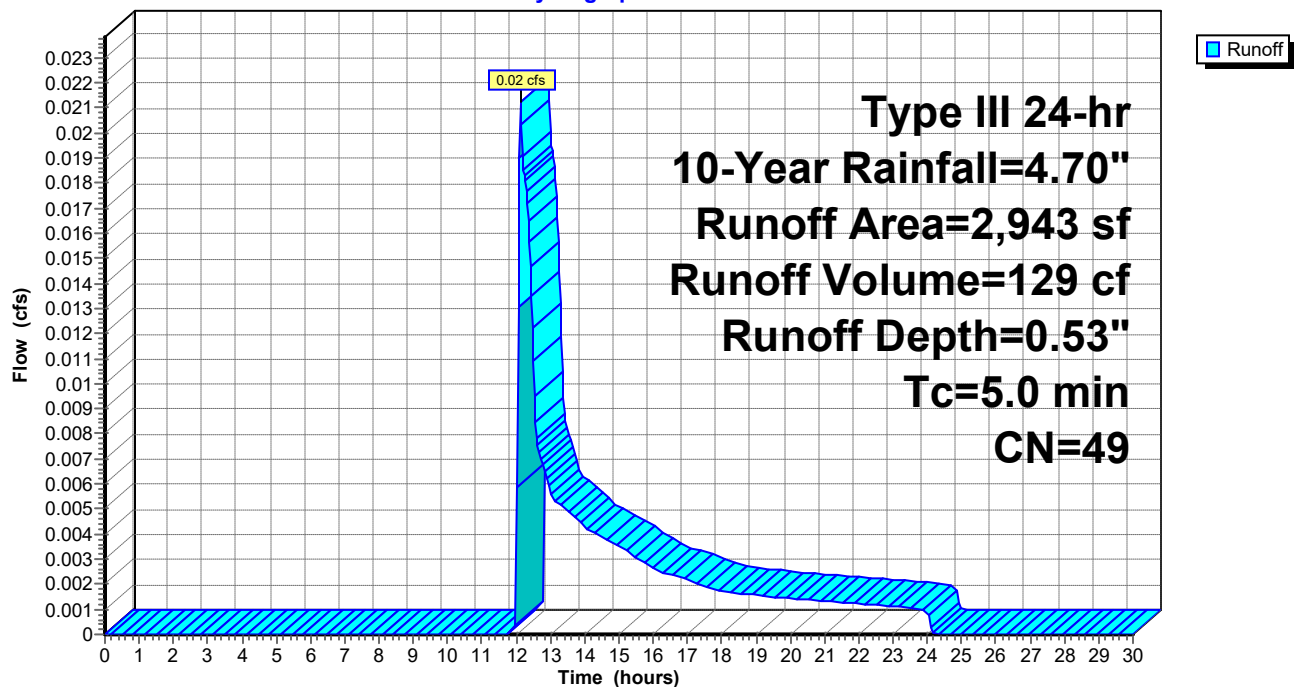
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
2,943	49	50-75% Grass cover, Fair, HSG A
2,943		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 4S: EX LANDSCAPE AREA**

Hydrograph



**EXISTING**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 10-Year Rainfall=4.70"

Printed 3/23/2022

Page 14

**Summary for Subcatchment 6S: EX. IMPERVIOUS**

Runoff = 0.03 cfs @ 12.07 hrs, Volume= 107 cf, Depth= 4.46"

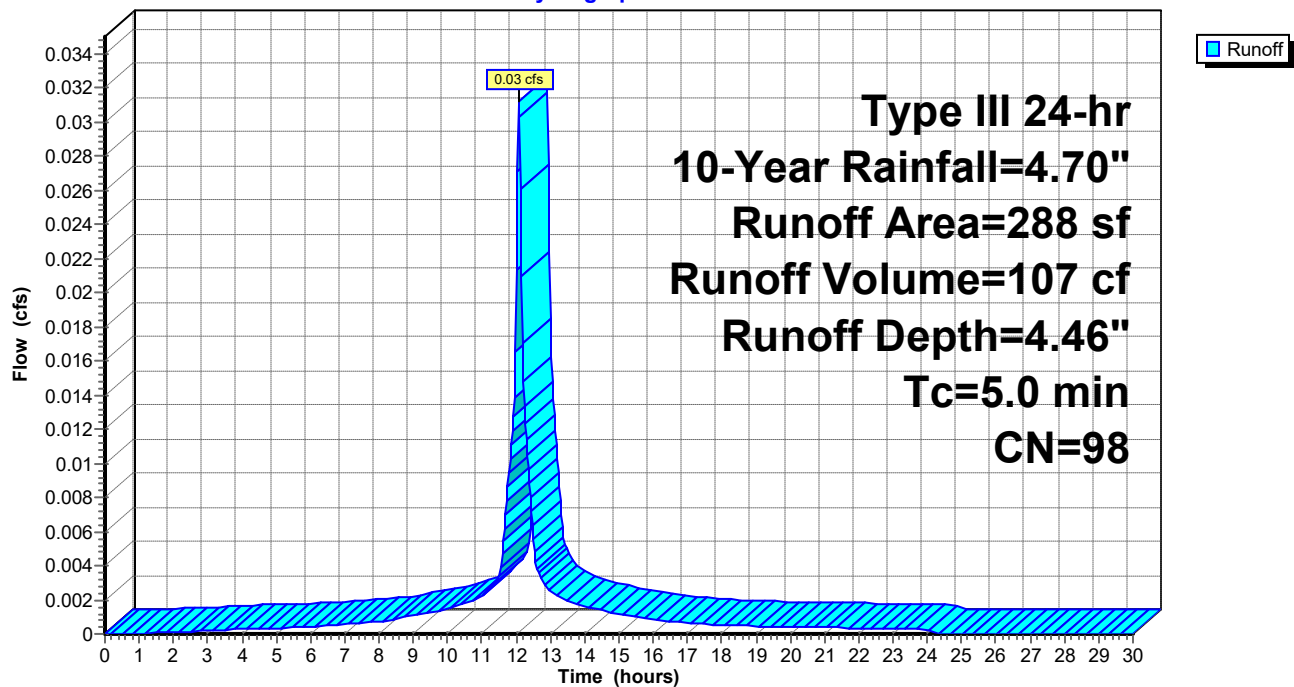
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
288	98	Unconnected pavement, HSG A
288		100.00% Impervious Area
288		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 6S: EX. IMPERVIOUS**

Hydrograph



## EXISTING

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 10-Year Rainfall=4.70"

Printed 3/23/2022

Page 15

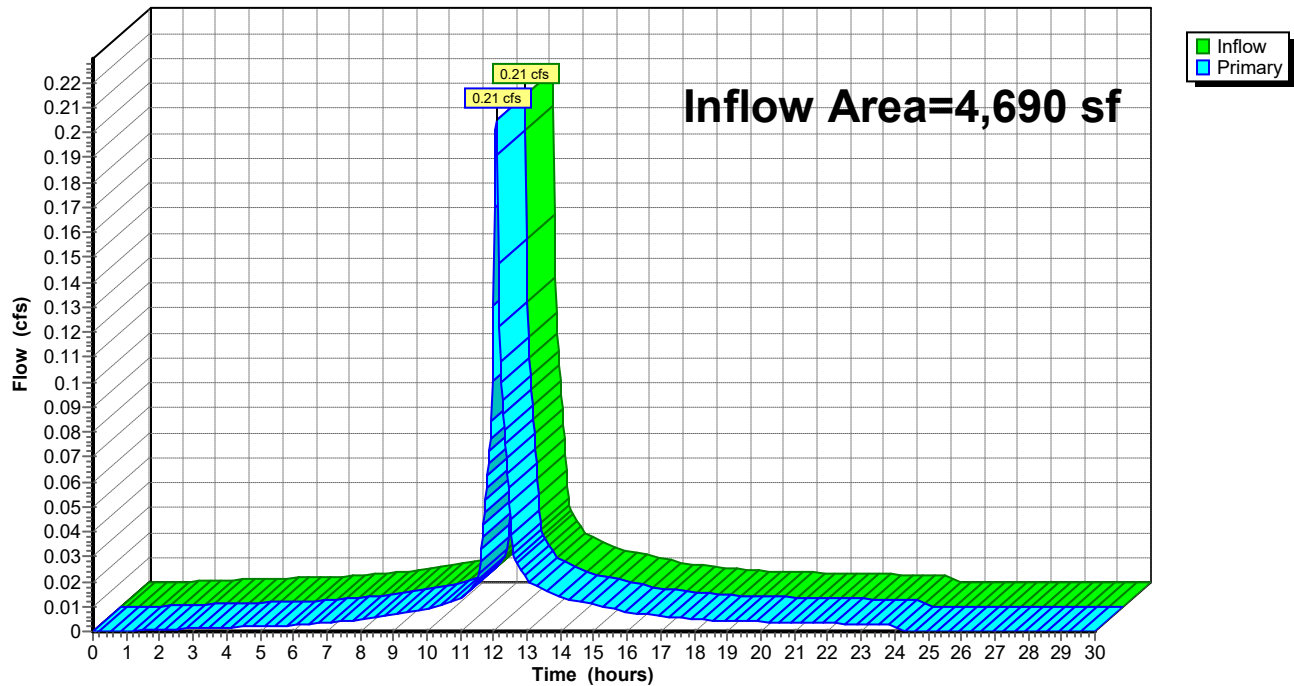
### Summary for Link 3L: EXISTING

Inflow Area = 4,690 sf, 37.25% Impervious, Inflow Depth = 1.99" for 10-Year event  
Inflow = 0.21 cfs @ 12.08 hrs, Volume= 779 cf  
Primary = 0.21 cfs @ 12.08 hrs, Volume= 779 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs

### Link 3L: EXISTING

Hydrograph



**EXISTING***Type III 24-hr 25-Year Rainfall=5.50"*

Prepared by SPRUHAN ENGINEERING P.E.

Printed 3/23/2022

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Page 16

Time span=0.00-30.00 hrs, dt=0.03 hrs, 1001 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: EX ROOF AREA**      Runoff Area=1,013 sf   100.00% Impervious   Runoff Depth=5.26"  
Tc=5.0 min   CN=98   Runoff=0.13 cfs   444 cf

**Subcatchment 2S: EX PAVED AREA**      Runoff Area=446 sf   100.00% Impervious   Runoff Depth=5.26"  
Tc=5.0 min   CN=98   Runoff=0.06 cfs   196 cf

**Subcatchment 4S: EX LANDSCAPE AREA**      Runoff Area=2,943 sf   0.00% Impervious   Runoff Depth=0.85"  
Tc=5.0 min   CN=49   Runoff=0.05 cfs   207 cf

**Subcatchment 6S: EX. IMPERVIOUS**      Runoff Area=288 sf   100.00% Impervious   Runoff Depth=5.26"  
Tc=5.0 min   CN=98   Runoff=0.04 cfs   126 cf

**Link 3L: EXISTING**

Inflow=0.27 cfs   973 cf  
Primary=0.27 cfs   973 cf

**Total Runoff Area = 4,690 sf   Runoff Volume = 973 cf   Average Runoff Depth = 2.49"**  
**62.75% Pervious = 2,943 sf   37.25% Impervious = 1,747 sf**

**EXISTING**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=5.50"

Printed 3/23/2022

Page 17

**Summary for Subcatchment 1S: EX ROOF AREA**

Runoff = 0.13 cfs @ 12.07 hrs, Volume= 444 cf, Depth= 5.26"

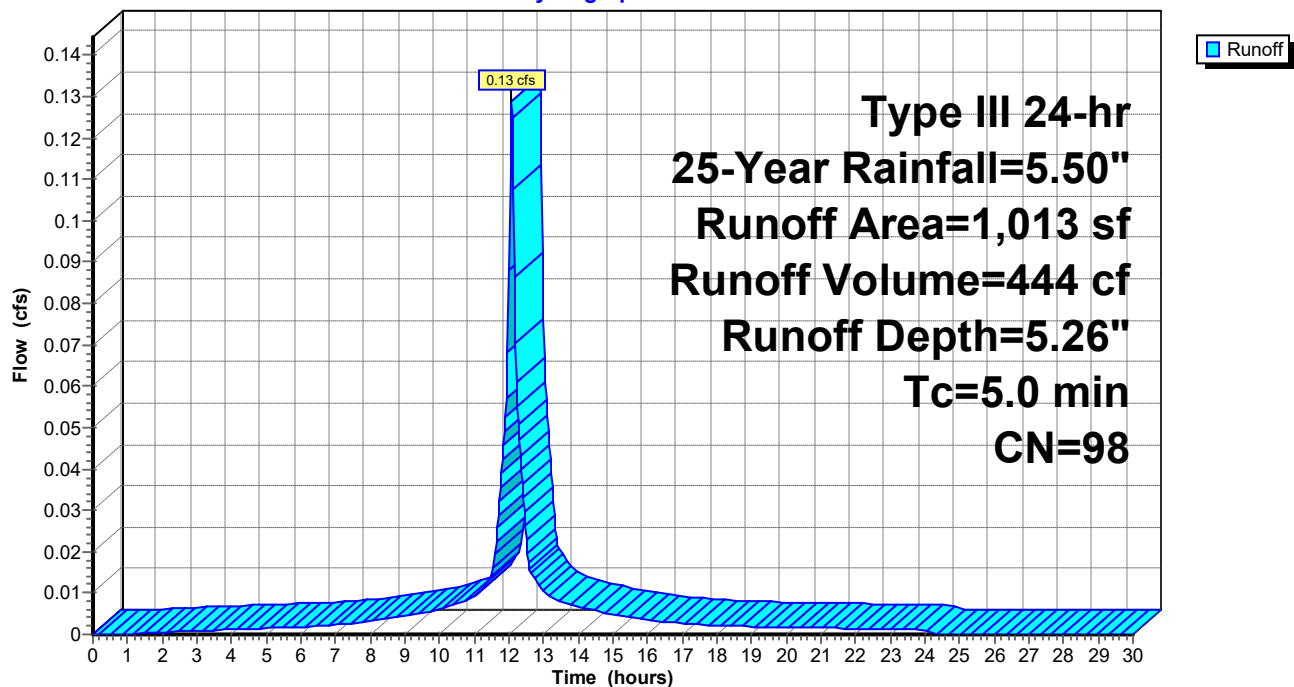
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
1,013	98	Roofs, HSG A
1,013		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 1S: EX ROOF AREA**

Hydrograph



**EXISTING**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=5.50"

Printed 3/23/2022

Page 18

**Summary for Subcatchment 2S: EX PAVED AREA**

Runoff = 0.06 cfs @ 12.07 hrs, Volume= 196 cf, Depth= 5.26"

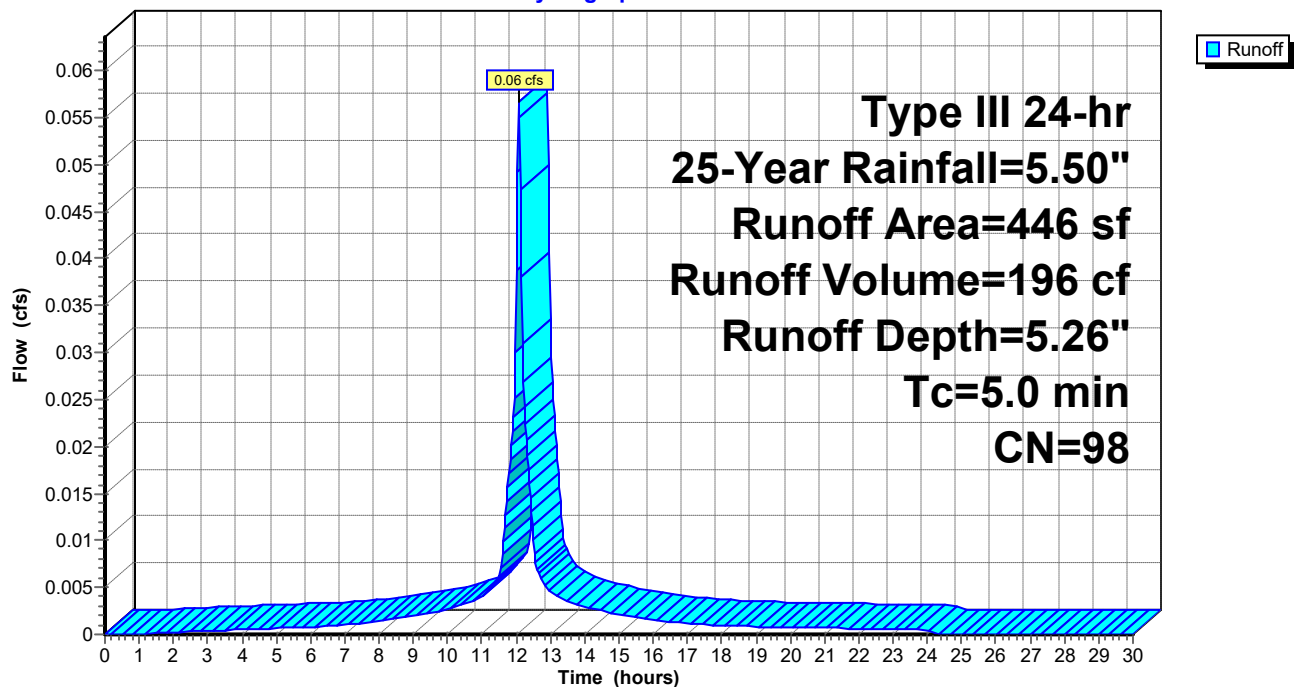
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
446	98	Paved parking, HSG A
446		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 2S: EX PAVED AREA**

Hydrograph



**EXISTING**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=5.50"

Printed 3/23/2022

Page 19

**Summary for Subcatchment 4S: EX LANDSCAPE AREA**

Runoff = 0.05 cfs @ 12.10 hrs, Volume= 207 cf, Depth= 0.85"

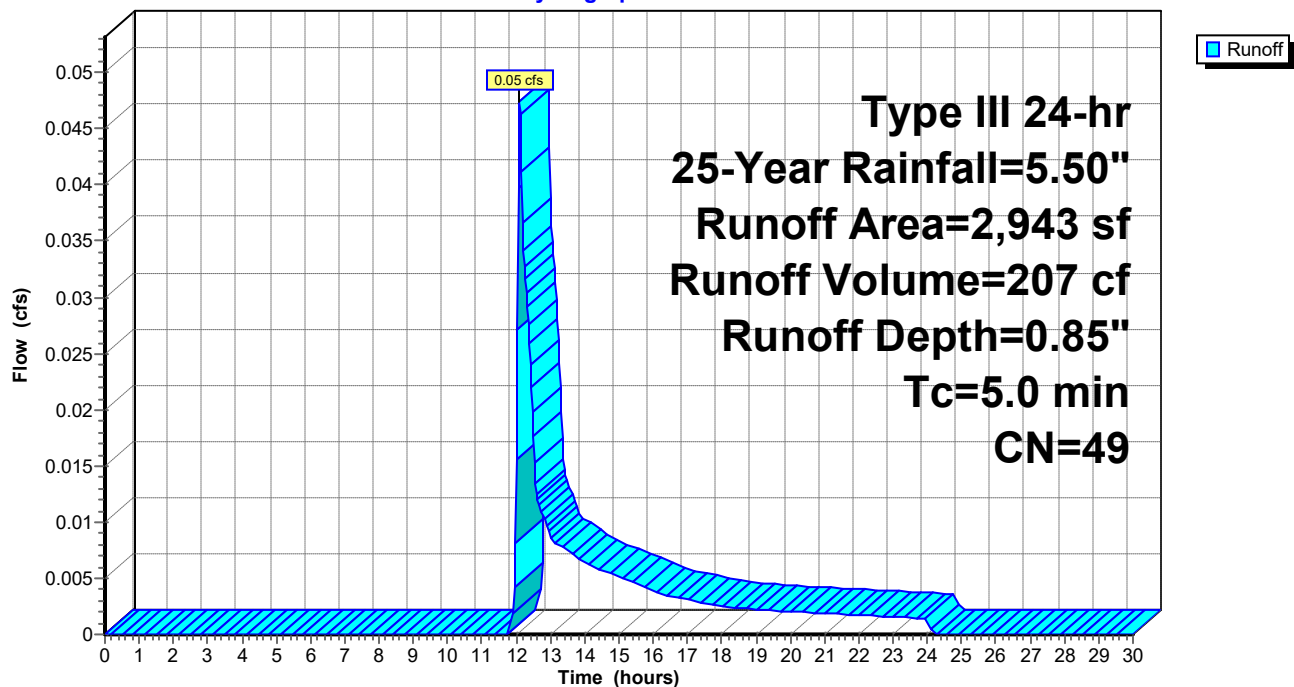
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
2,943	49	50-75% Grass cover, Fair, HSG A
2,943		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 4S: EX LANDSCAPE AREA**

Hydrograph



**EXISTING**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=5.50"

Printed 3/23/2022

Page 20

**Summary for Subcatchment 6S: EX. IMPERVIOUS**

Runoff = 0.04 cfs @ 12.07 hrs, Volume= 126 cf, Depth= 5.26"

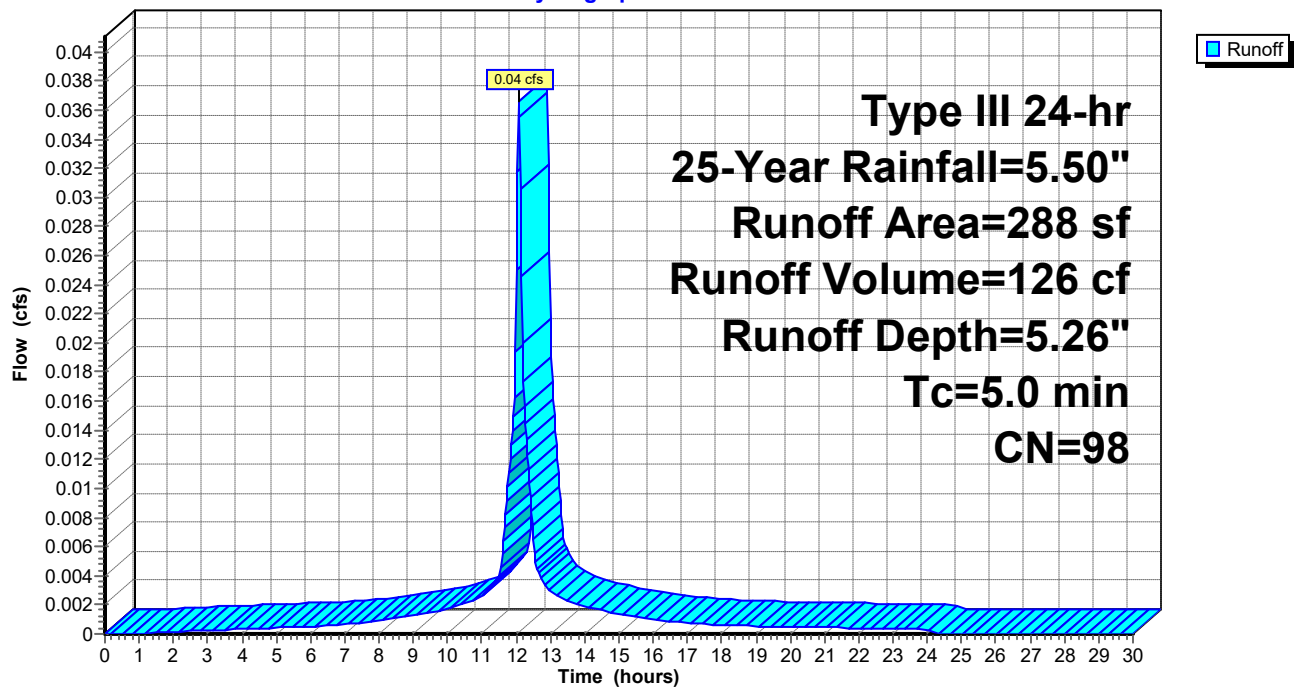
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
288	98	Unconnected pavement, HSG A
288		100.00% Impervious Area
288		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 6S: EX. IMPERVIOUS**

Hydrograph



## EXISTING

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=5.50"

Printed 3/23/2022

Page 21

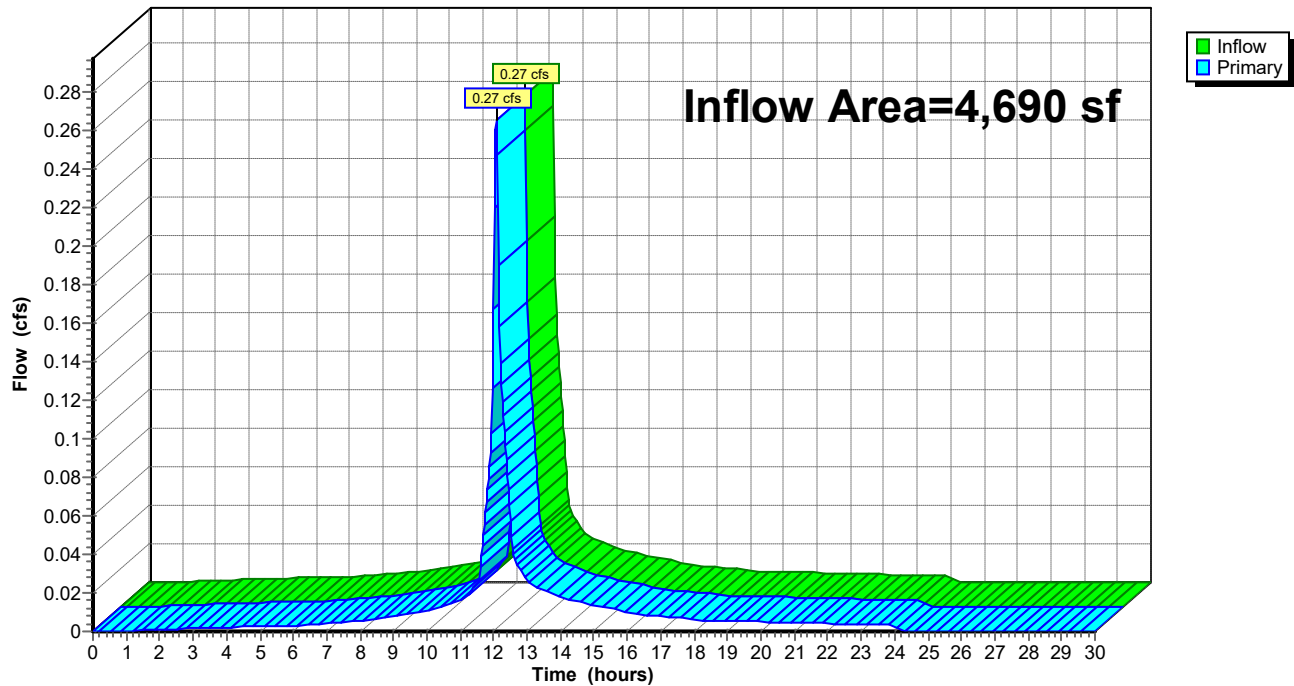
### Summary for Link 3L: EXISTING

Inflow Area = 4,690 sf, 37.25% Impervious, Inflow Depth = 2.49" for 25-Year event  
Inflow = 0.27 cfs @ 12.08 hrs, Volume= 973 cf  
Primary = 0.27 cfs @ 12.08 hrs, Volume= 973 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs

### Link 3L: EXISTING

Hydrograph



**EXISTING***Type III 24-hr 100-Year Rainfall=6.50"*

Prepared by SPRUHAN ENGINEERING P.E.

Printed 3/23/2022

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Page 22

Time span=0.00-30.00 hrs, dt=0.03 hrs, 1001 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: EX ROOF AREA**      Runoff Area=1,013 sf   100.00% Impervious   Runoff Depth=6.26"  
Tc=5.0 min   CN=98   Runoff=0.15 cfs   529 cf

**Subcatchment 2S: EX PAVED AREA**      Runoff Area=446 sf   100.00% Impervious   Runoff Depth=6.26"  
Tc=5.0 min   CN=98   Runoff=0.07 cfs   233 cf

**Subcatchment 4S: EX LANDSCAPE AREA**      Runoff Area=2,943 sf   0.00% Impervious   Runoff Depth=1.32"  
Tc=5.0 min   CN=49   Runoff=0.09 cfs   323 cf

**Subcatchment 6S: EX. IMPERVIOUS**      Runoff Area=288 sf   100.00% Impervious   Runoff Depth=6.26"  
Tc=5.0 min   CN=98   Runoff=0.04 cfs   150 cf

**Link 3L: EXISTING**

Inflow=0.35 cfs   1,234 cf  
Primary=0.35 cfs   1,234 cf

**Total Runoff Area = 4,690 sf   Runoff Volume = 1,234 cf   Average Runoff Depth = 3.16"**  
**62.75% Pervious = 2,943 sf   37.25% Impervious = 1,747 sf**

**EXISTING**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 100-Year Rainfall=6.50"

Printed 3/23/2022

Page 23

**Summary for Subcatchment 1S: EX ROOF AREA**

Runoff = 0.15 cfs @ 12.07 hrs, Volume= 529 cf, Depth= 6.26"

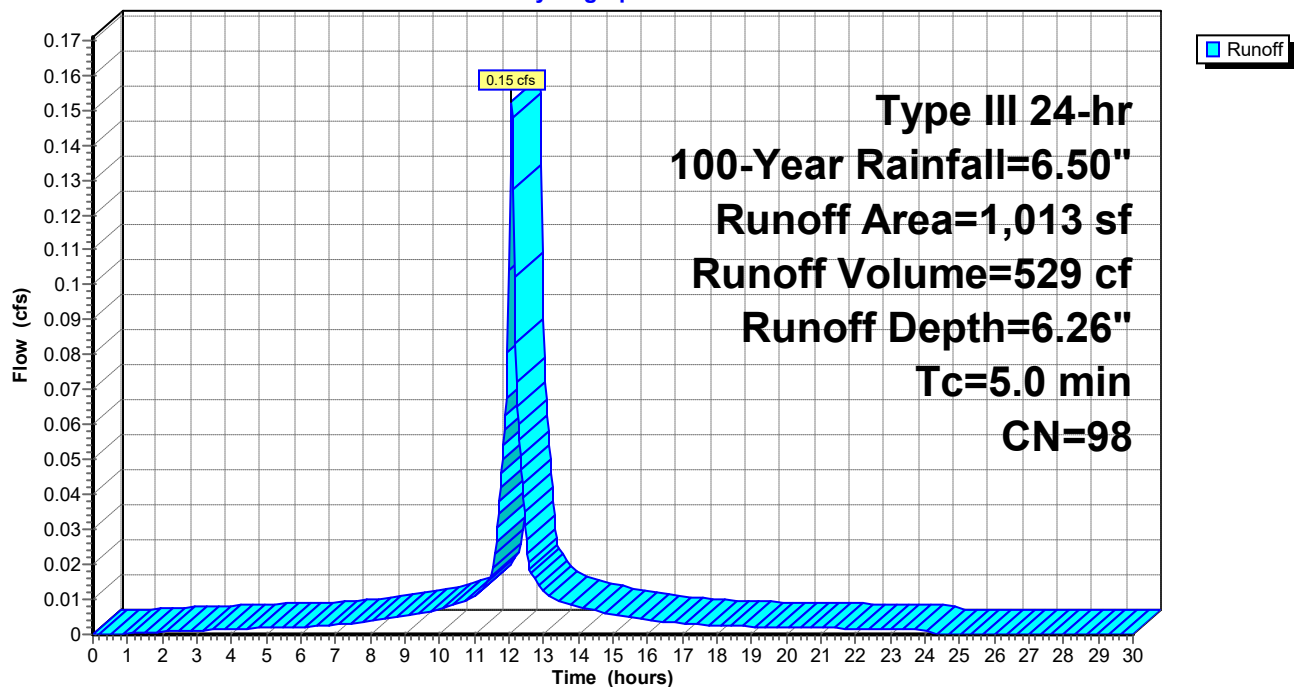
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,013	98	Roofs, HSG A
1,013		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 1S: EX ROOF AREA**

Hydrograph



**EXISTING**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 100-Year Rainfall=6.50"

Printed 3/23/2022

Page 24

**Summary for Subcatchment 2S: EX PAVED AREA**

Runoff = 0.07 cfs @ 12.07 hrs, Volume= 233 cf, Depth= 6.26"

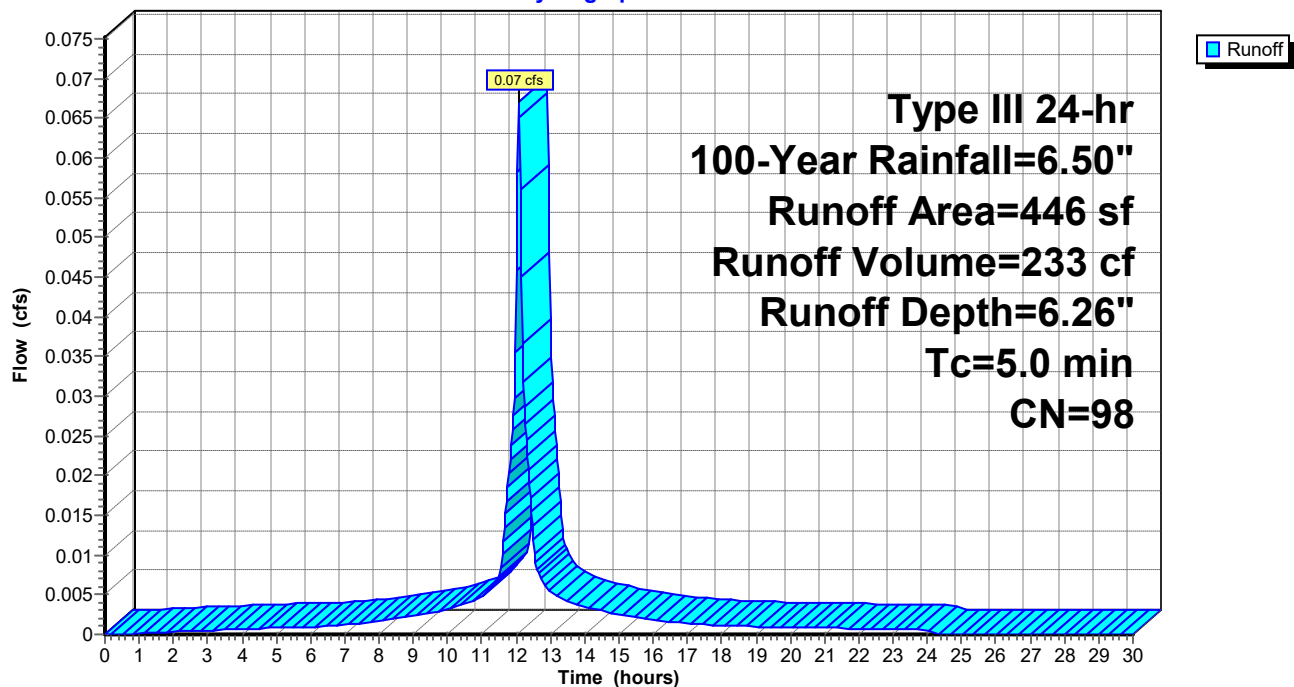
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
446	98	Paved parking, HSG A
446		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 2S: EX PAVED AREA**

Hydrograph



**EXISTING**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 100-Year Rainfall=6.50"

Printed 3/23/2022

Page 25

**Summary for Subcatchment 4S: EX LANDSCAPE AREA**

Runoff = 0.09 cfs @ 12.09 hrs, Volume= 323 cf, Depth= 1.32"

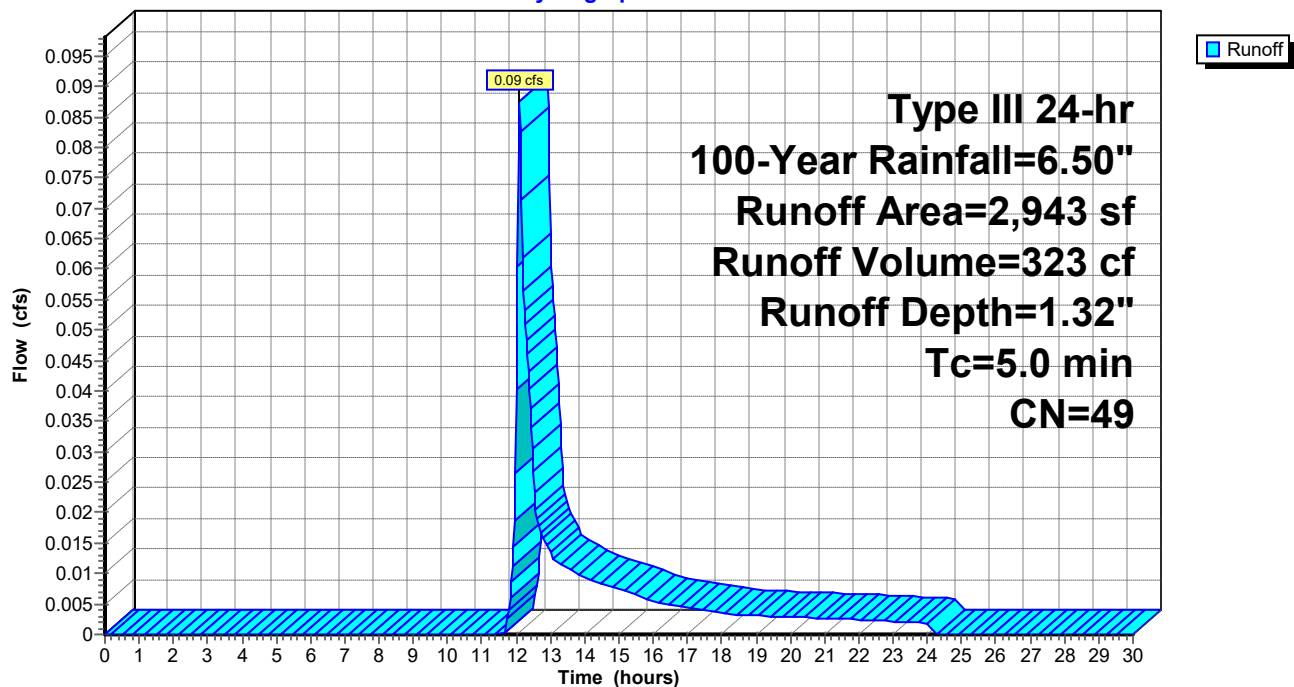
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,943	49	50-75% Grass cover, Fair, HSG A
2,943		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 4S: EX LANDSCAPE AREA**

Hydrograph



**EXISTING**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 100-Year Rainfall=6.50"

Printed 3/23/2022

Page 26

**Summary for Subcatchment 6S: EX. IMPERVIOUS**

Runoff = 0.04 cfs @ 12.07 hrs, Volume= 150 cf, Depth= 6.26"

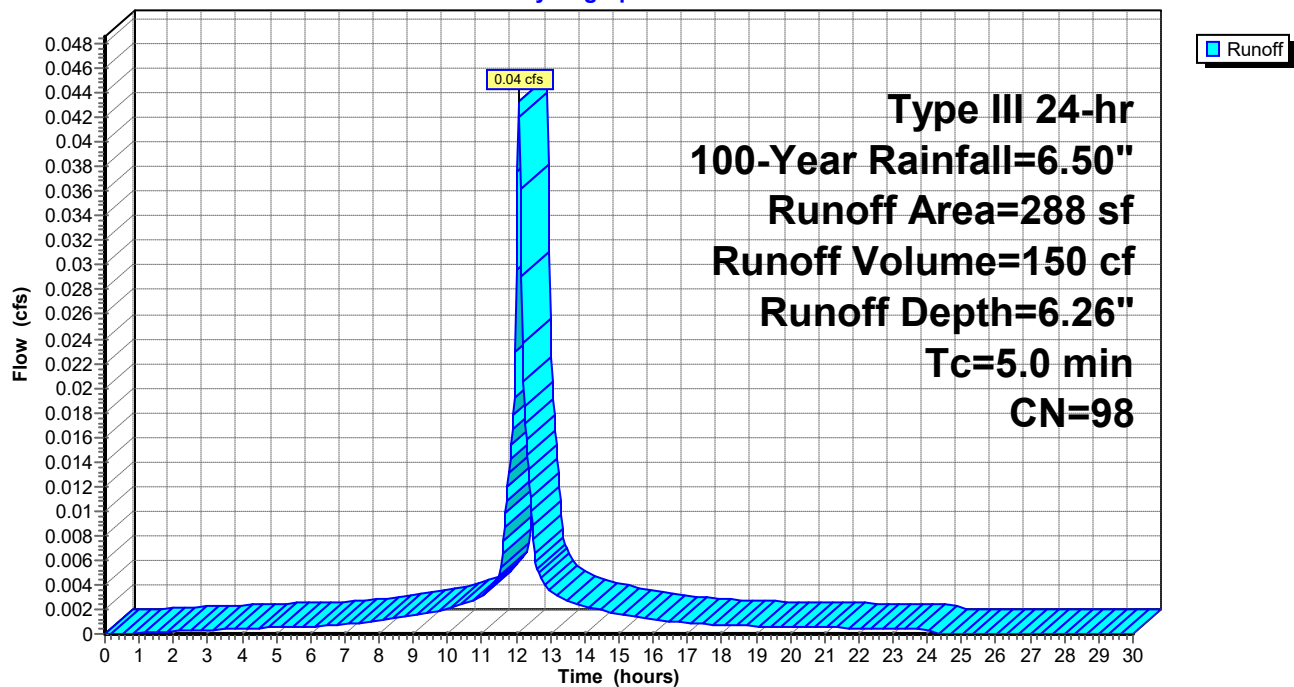
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
288	98	Unconnected pavement, HSG A
288		100.00% Impervious Area
288		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 6S: EX. IMPERVIOUS**

Hydrograph



## EXISTING

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 100-Year Rainfall=6.50"

Printed 3/23/2022

Page 27

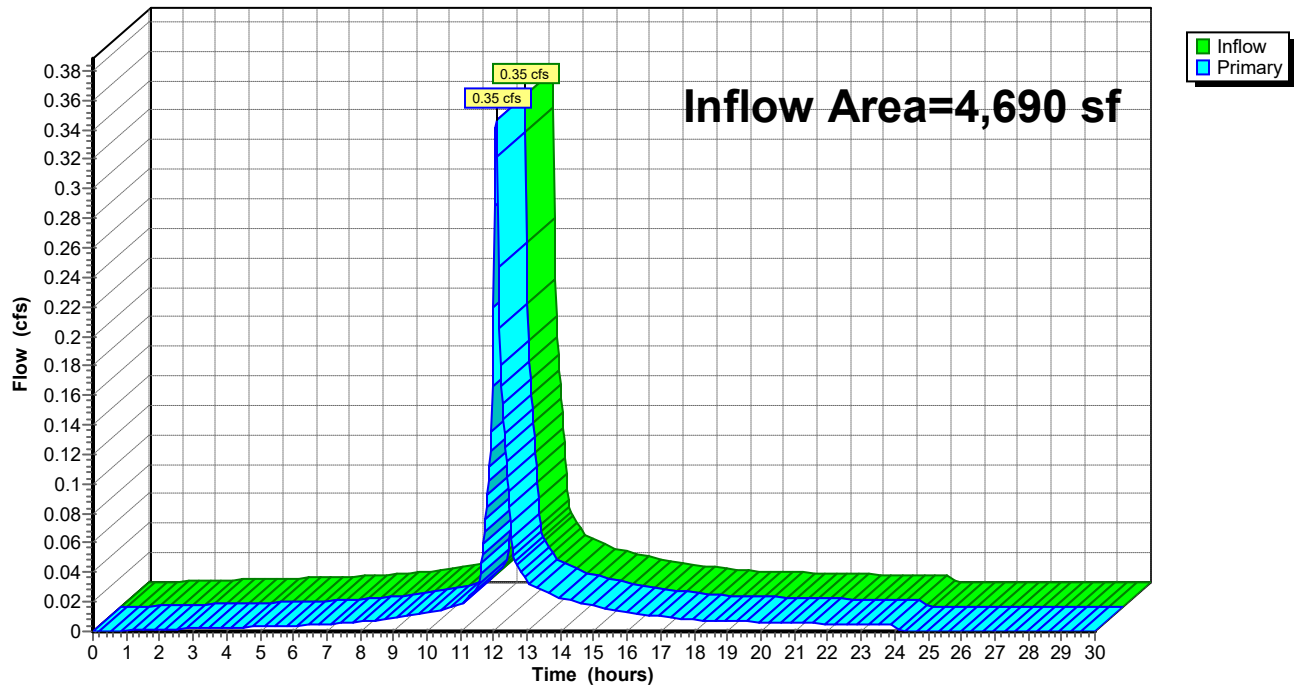
### Summary for Link 3L: EXISTING

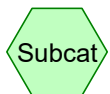
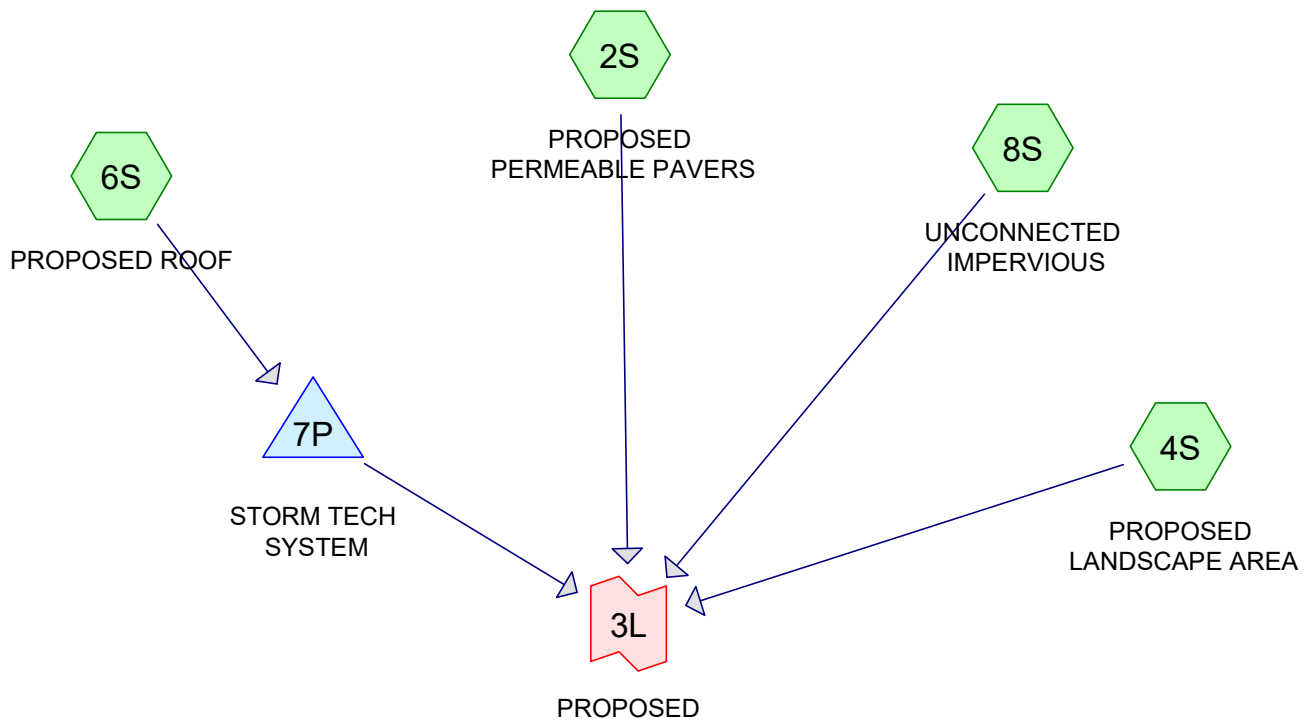
Inflow Area = 4,690 sf, 37.25% Impervious, Inflow Depth = 3.16" for 100-Year event  
Inflow = 0.35 cfs @ 12.08 hrs, Volume= 1,234 cf  
Primary = 0.35 cfs @ 12.08 hrs, Volume= 1,234 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs

### Link 3L: EXISTING

Hydrograph

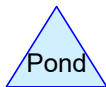




Subcat



Reach



Pond



Link

#### Routing Diagram for PROPOSED

Prepared by SPRUHAN ENGINEERING P.E., Printed 3/23/2022  
HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

## PROPOSED

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Printed 3/23/2022

Page 2

### Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
2,133	49	50-75% Grass cover, Fair, HSG A (4S)
679	85	Permeable Pavers (2S)
1,470	98	Roofs, HSG A (6S)
408	98	Unconnected pavement, HSG A (8S)
<b>4,690</b>	<b>74</b>	<b>TOTAL AREA</b>

## PROPOSED

Prepared by SPRUHAN ENGINEERING P.E.

Printed 3/23/2022

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Page 3

### Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
4,011	HSG A	4S, 6S, 8S
0	HSG B	
0	HSG C	
0	HSG D	
679	Other	2S
<b>4,690</b>		<b>TOTAL AREA</b>

**PROPOSED***Type III 24-hr 2-Year Rainfall=3.25"*

Prepared by SPRUHAN ENGINEERING P.E.

Printed 3/23/2022

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Page 4

Time span=0.00-30.00 hrs, dt=0.03 hrs, 1001 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 2S: PROPOSED PERMEABLE** Runoff Area=679 sf 0.00% Impervious Runoff Depth=1.80"  
Tc=15.0 min CN=85 Runoff=0.02 cfs 102 cf

**Subcatchment 4S: PROPOSED LANDSCAPE** Runoff Area=2,133 sf 0.00% Impervious Runoff Depth=0.12"  
Tc=5.0 min CN=49 Runoff=0.00 cfs 21 cf

**Subcatchment 6S: PROPOSED ROOF** Runoff Area=1,470 sf 100.00% Impervious Runoff Depth=3.02"  
Tc=5.0 min CN=98 Runoff=0.11 cfs 370 cf

**Subcatchment 8S: UNCONNECTED** Runoff Area=408 sf 100.00% Impervious Runoff Depth=3.02"  
Tc=5.0 min CN=98 Runoff=0.03 cfs 103 cf

**Pond 7P: STORM TECH SYSTEM** Peak Elev=5.10' Storage=64 cf Inflow=0.11 cfs 370 cf  
Discarded=0.03 cfs 370 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 370 cf

**Link 3L: PROPOSED**

Inflow=0.05 cfs 225 cf

Primary=0.05 cfs 225 cf

**Total Runoff Area = 4,690 sf Runoff Volume = 595 cf Average Runoff Depth = 1.52"**  
**59.96% Pervious = 2,812 sf 40.04% Impervious = 1,878 sf**

**PROPOSED**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.25"

Printed 3/23/2022

Page 5

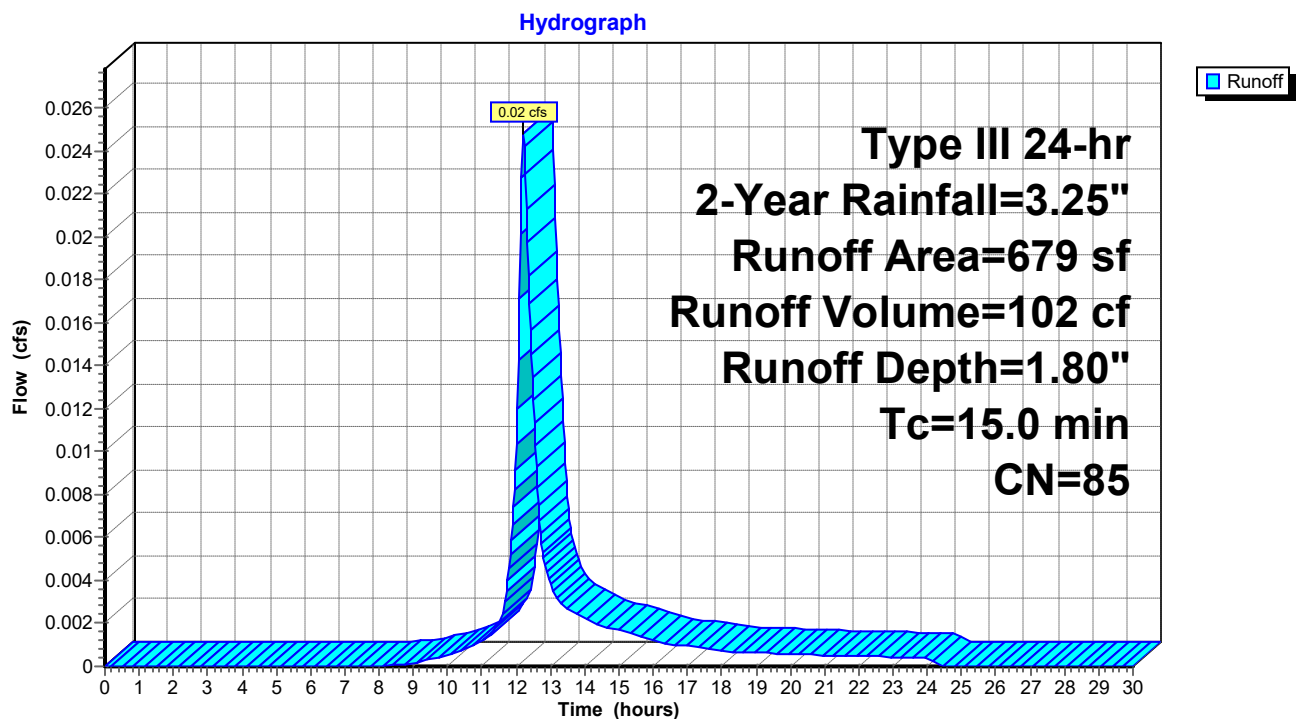
**Summary for Subcatchment 2S: PROPOSED PERMEABLE PAVERS**

Runoff = 0.02 cfs @ 12.21 hrs, Volume= 102 cf, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2-Year Rainfall=3.25"

Area (sf)	CN	Description
* 679	85	Permeable Pavers
679		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 2S: PROPOSED PERMEABLE PAVERS**

**PROPOSED**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.25"

Printed 3/23/2022

Page 6

**Summary for Subcatchment 4S: PROPOSED LANDSCAPE AREA**

Runoff = 0.00 cfs @ 12.48 hrs, Volume= 21 cf, Depth= 0.12"

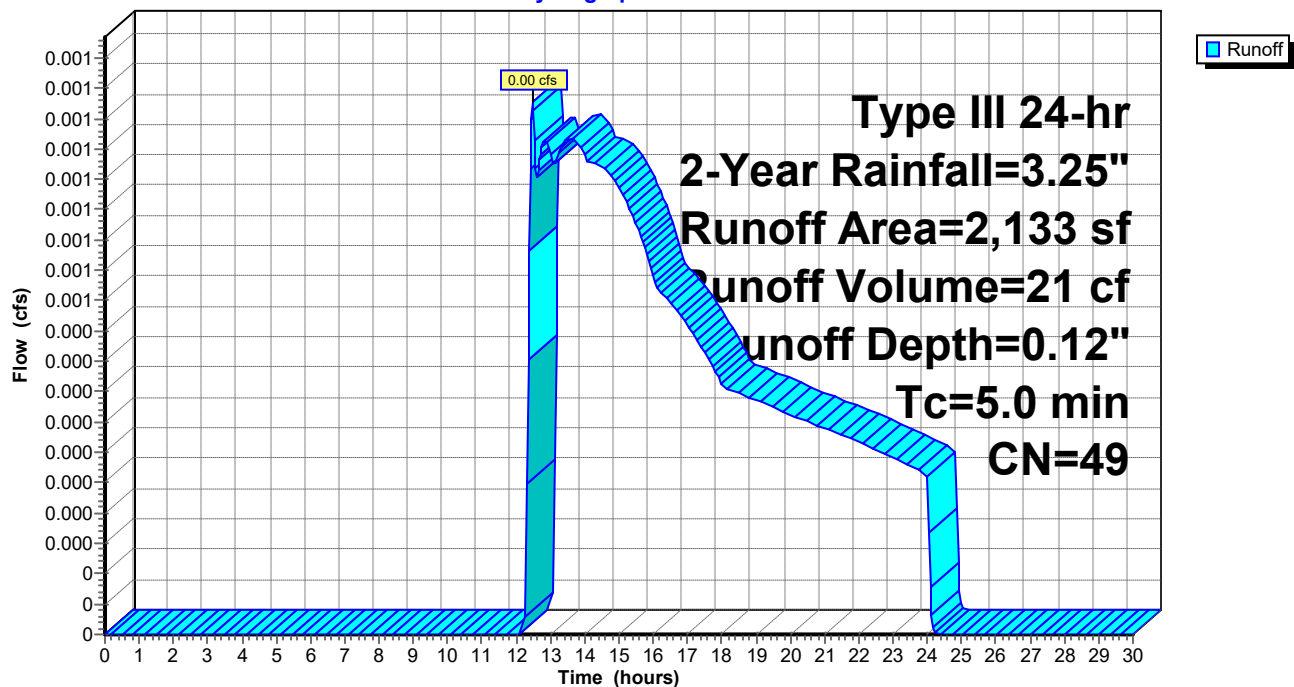
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2-Year Rainfall=3.25"

Area (sf)	CN	Description
2,133	49	50-75% Grass cover, Fair, HSG A
2,133		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 4S: PROPOSED LANDSCAPE AREA**

Hydrograph



**PROPOSED**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.25"

Printed 3/23/2022

Page 7

**Summary for Subcatchment 6S: PROPOSED ROOF**

Runoff = 0.11 cfs @ 12.07 hrs, Volume= 370 cf, Depth= 3.02"

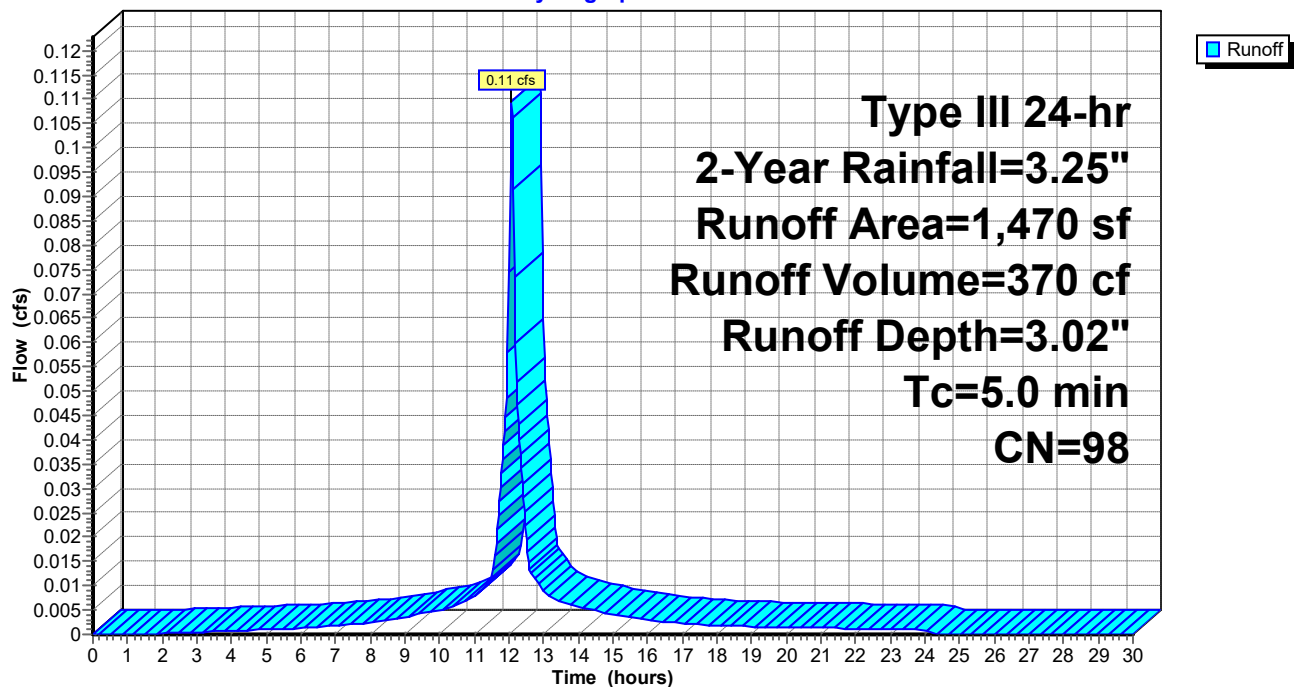
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2-Year Rainfall=3.25"

Area (sf)	CN	Description
1,470	98	Roofs, HSG A
1,470		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 6S: PROPOSED ROOF**

Hydrograph



**PROPOSED**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.25"

Printed 3/23/2022

Page 8

**Summary for Subcatchment 8S: UNCONNECTED IMPERVIOUS**

Runoff = 0.03 cfs @ 12.07 hrs, Volume= 103 cf, Depth= 3.02"

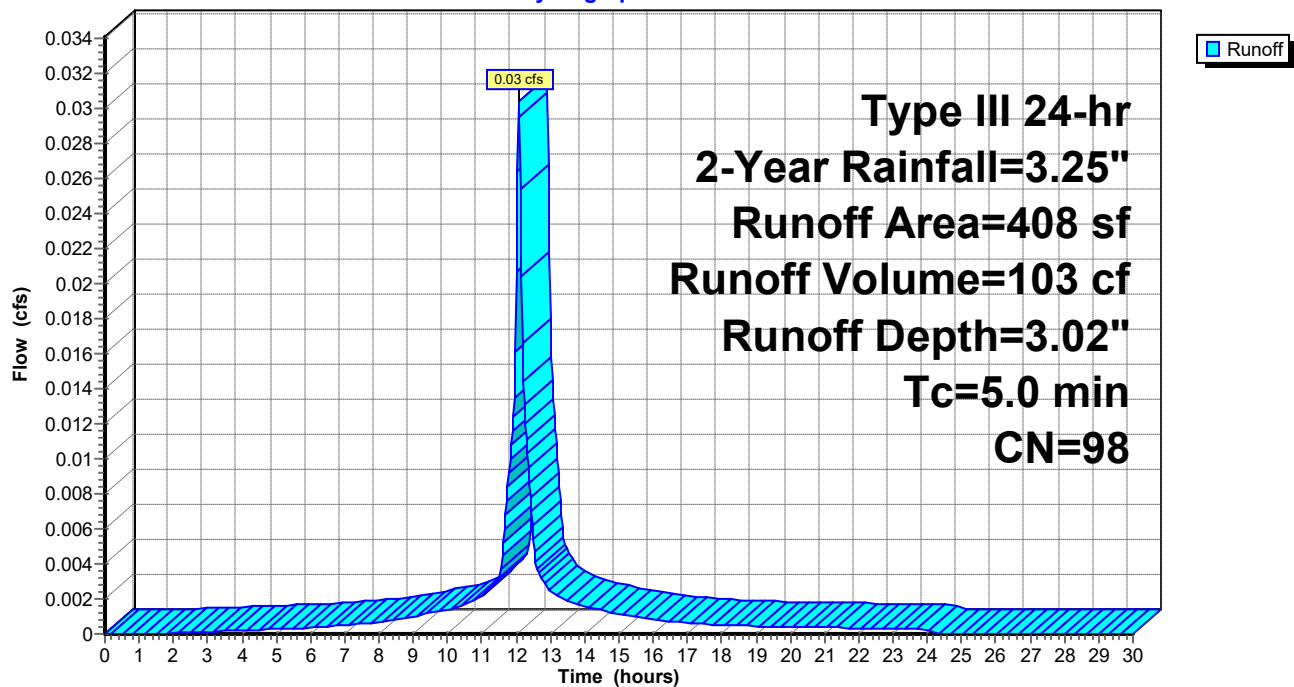
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 2-Year Rainfall=3.25"

Area (sf)	CN	Description
408	98	Unconnected pavement, HSG A
408		100.00% Impervious Area
408		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 8S: UNCONNECTED IMPERVIOUS**

Hydrograph



**PROPOSED**

Type III 24-hr 2-Year Rainfall=3.25"

Prepared by SPRUHAN ENGINEERING P.E.

Printed 3/23/2022

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Page 9

**Summary for Pond 7P: STORM TECH SYSTEM**

Inflow Area = 1,470 sf, 100.00% Impervious, Inflow Depth = 3.02" for 2-Year event  
 Inflow = 0.11 cfs @ 12.07 hrs, Volume= 370 cf  
 Outflow = 0.03 cfs @ 11.79 hrs, Volume= 370 cf, Atten= 73%, Lag= 0.0 min  
 Discarded = 0.03 cfs @ 11.79 hrs, Volume= 370 cf  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs

Peak Elev= 5.10' @ 12.40 hrs Surf.Area= 156 sf Storage= 64 cf

Plug-Flow detention time= 10.2 min calculated for 369 cf (100% of inflow)

Center-of-Mass det. time= 10.2 min ( 765.3 - 755.1 )

Volume	Invert	Avail.Storage	Storage Description
#1A	4.00'	185 cf	<b>7.08'W x 22.01'L x 4.00'H Field A</b> 624 cf Overall - 95 cf Embedded = 529 cf x 35.0% Voids
#2A	5.00'	95 cf	<b>ADS_StormTech SC-740</b> x 2 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 6.45 sf x 1 rows
#3	8.00'	15 cf	<b>Ponding</b> Listed below -Impervious
		295 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Cum.Store (cubic-feet)
8.00	0
9.00	10
9.20	15

Device	Routing	Invert	Outlet Devices
#1	Discarded	4.00'	<b>8.270 in/hr Exfiltration over Surface area</b>
#2	Primary	7.90'	<b>4.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Discarded OutFlow** Max=0.03 cfs @ 11.79 hrs HW=4.05' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=4.00' (Free Discharge)↑**2=Orifice/Grate** ( Controls 0.00 cfs)

## PROPOSED

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.25"

Printed 3/23/2022

Page 10

### Pond 7P: STORM TECH SYSTEM - Chamber Wizard Field A

**Chamber Model = ADS\_StormTech SC-740 (ADS StormTech® SC-740 without end caps)**

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

Row Length Adjustment= +0.44' x 6.45 sf x 1 rows

2 Chambers/Row x 7.12' Long +0.44' Row Adjustment = 14.68' Row Length +44.0" End Stone x 2 = 22.01' Base Length

1 Rows x 51.0" Wide + 17.0" Side Stone x 2 = 7.08' Base Width

12.0" Base + 30.0" Chamber Height + 6.0" Cover = 4.00' Field Height

2 Chambers x 45.9 cf +0.44' Row Adjustment x 6.45 sf x 1 Rows = 94.7 cf Chamber Storage

623.7 cf Field - 94.7 cf Chambers = 529.0 cf Stone x 35.0% Voids = 185.1 cf Stone Storage

Chamber Storage + Stone Storage = 279.8 cf = 0.006 af

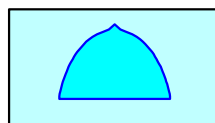
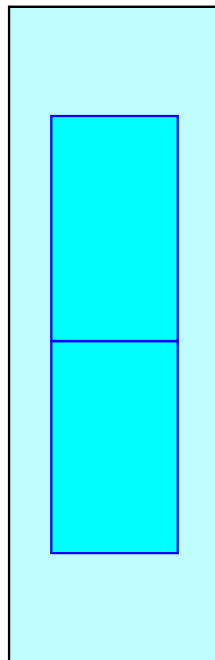
Overall Storage Efficiency = 44.9%

Overall System Size = 22.01' x 7.08' x 4.00'

2 Chambers

23.1 cy Field

19.6 cy Stone



## PROPOSED

Prepared by SPRUHAN ENGINEERING P.E.

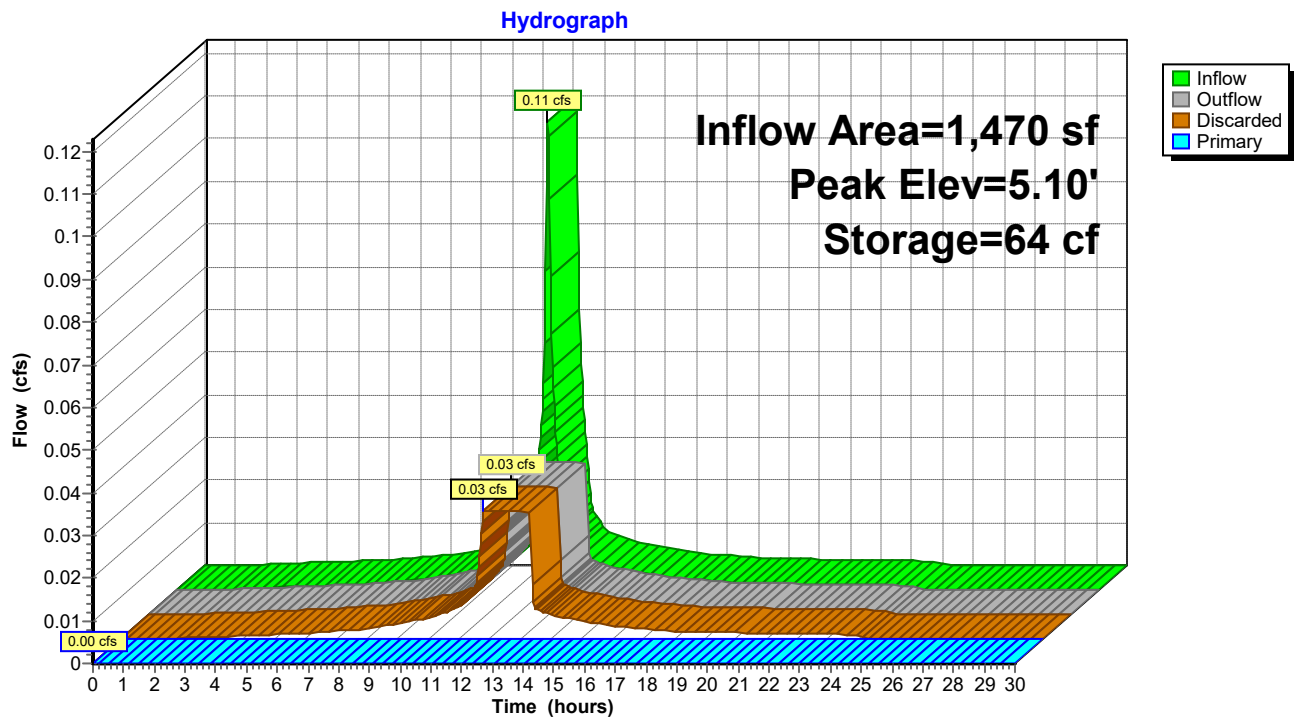
HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.25"

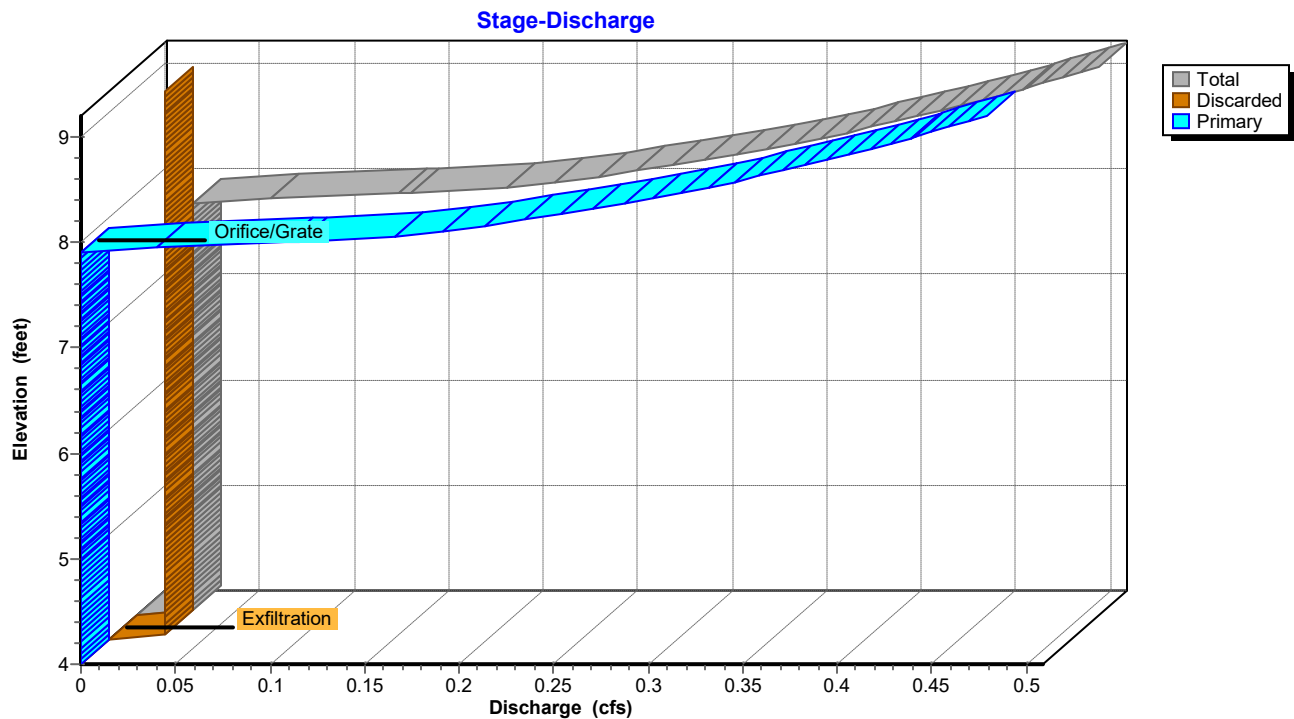
Printed 3/23/2022

Page 11

### Pond 7P: STORM TECH SYSTEM



### Pond 7P: STORM TECH SYSTEM



# PROPOSED

Prepared by SPRUHAN ENGINEERING P.E.

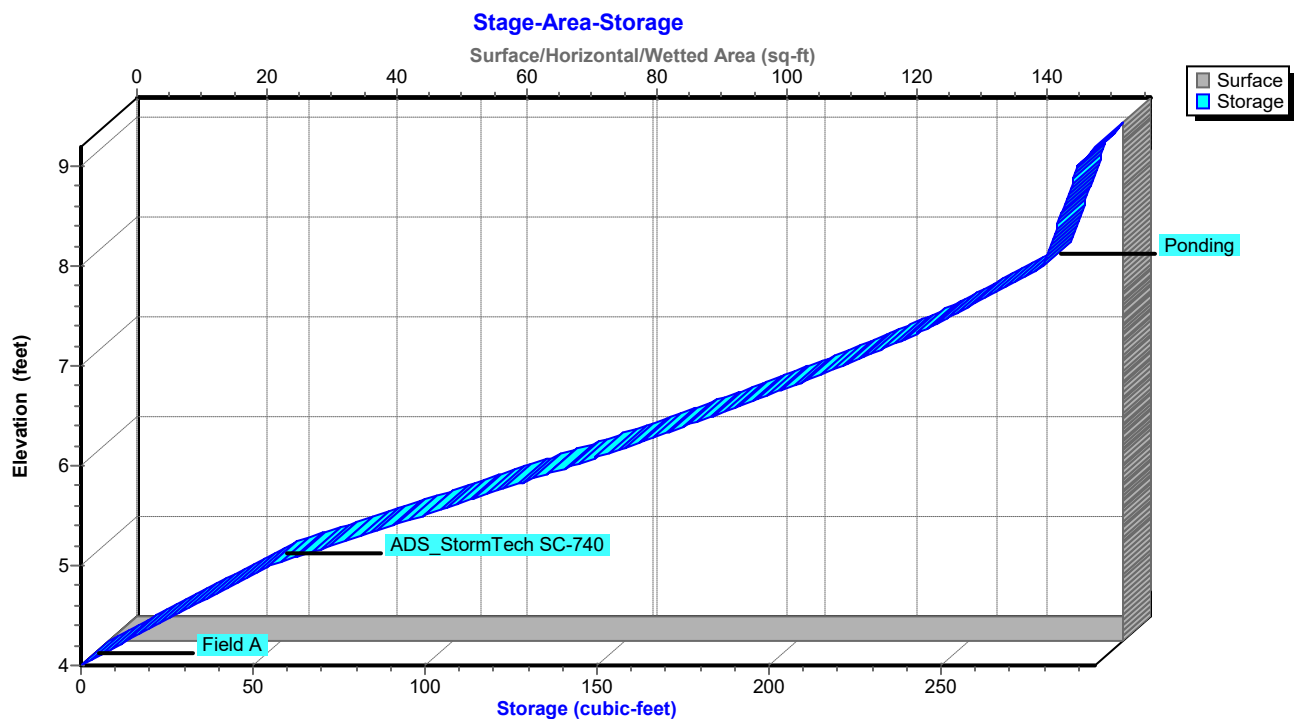
HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.25"

Printed 3/23/2022

Page 12

## Pond 7P: STORM TECH SYSTEM



## PROPOSED

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 2-Year Rainfall=3.25"

Printed 3/23/2022

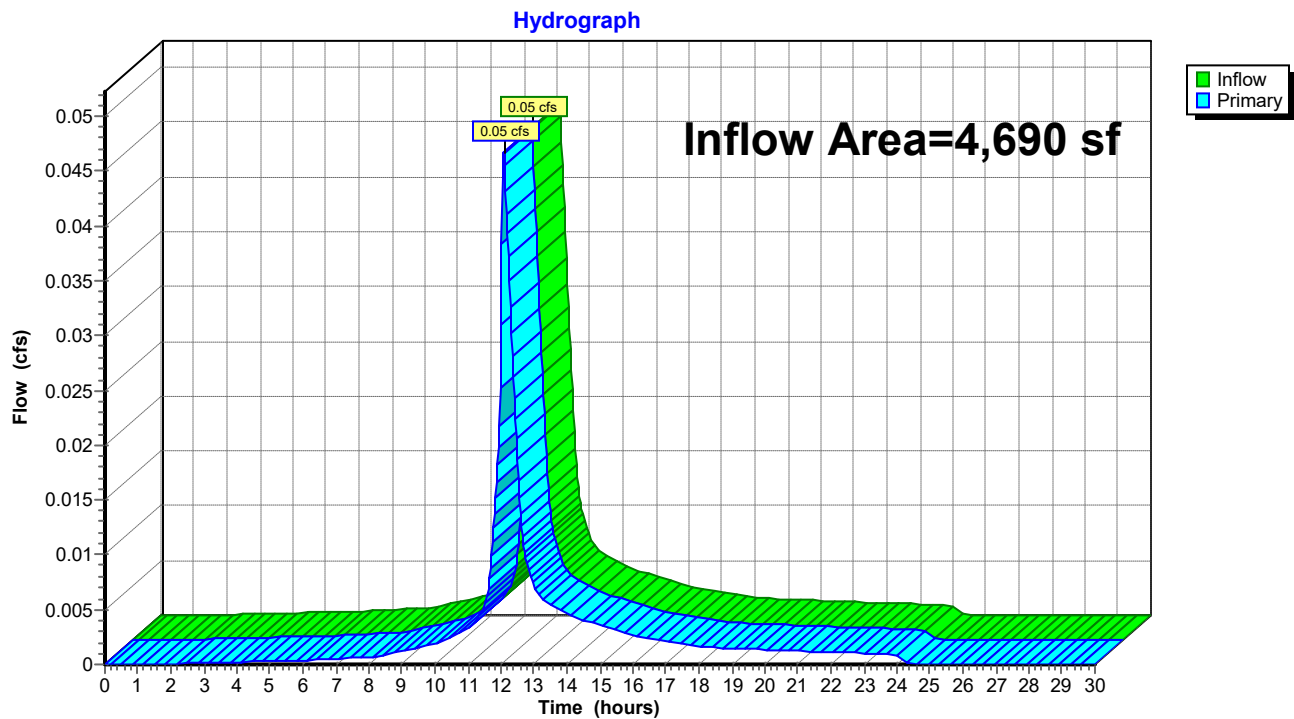
Page 13

### Summary for Link 3L: PROPOSED

Inflow Area = 4,690 sf, 40.04% Impervious, Inflow Depth = 0.58" for 2-Year event  
Inflow = 0.05 cfs @ 12.10 hrs, Volume= 225 cf  
Primary = 0.05 cfs @ 12.10 hrs, Volume= 225 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs

### Link 3L: PROPOSED



**PROPOSED***Type III 24-hr 10-Year Rainfall=4.70"*

Prepared by SPRUHAN ENGINEERING P.E.

Printed 3/23/2022

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Page 14

Time span=0.00-30.00 hrs, dt=0.03 hrs, 1001 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 2S: PROPOSED PERMEABLE** Runoff Area=679 sf 0.00% Impervious Runoff Depth=3.09"  
Tc=15.0 min CN=85 Runoff=0.04 cfs 175 cf

**Subcatchment 4S: PROPOSED LANDSCAPE** Runoff Area=2,133 sf 0.00% Impervious Runoff Depth=0.53"  
Tc=5.0 min CN=49 Runoff=0.02 cfs 94 cf

**Subcatchment 6S: PROPOSED ROOF** Runoff Area=1,470 sf 100.00% Impervious Runoff Depth=4.46"  
Tc=5.0 min CN=98 Runoff=0.16 cfs 547 cf

**Subcatchment 8S: UNCONNECTED** Runoff Area=408 sf 100.00% Impervious Runoff Depth=4.46"  
Tc=5.0 min CN=98 Runoff=0.04 cfs 152 cf

**Pond 7P: STORM TECH SYSTEM** Peak Elev=5.84' Storage=128 cf Inflow=0.16 cfs 547 cf  
Discarded=0.03 cfs 547 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 547 cf

**Link 3L: PROPOSED** Inflow=0.09 cfs 420 cf  
Primary=0.09 cfs 420 cf

**Total Runoff Area = 4,690 sf Runoff Volume = 967 cf Average Runoff Depth = 2.47"**  
**59.96% Pervious = 2,812 sf 40.04% Impervious = 1,878 sf**

**PROPOSED**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 10-Year Rainfall=4.70"

Printed 3/23/2022

Page 15

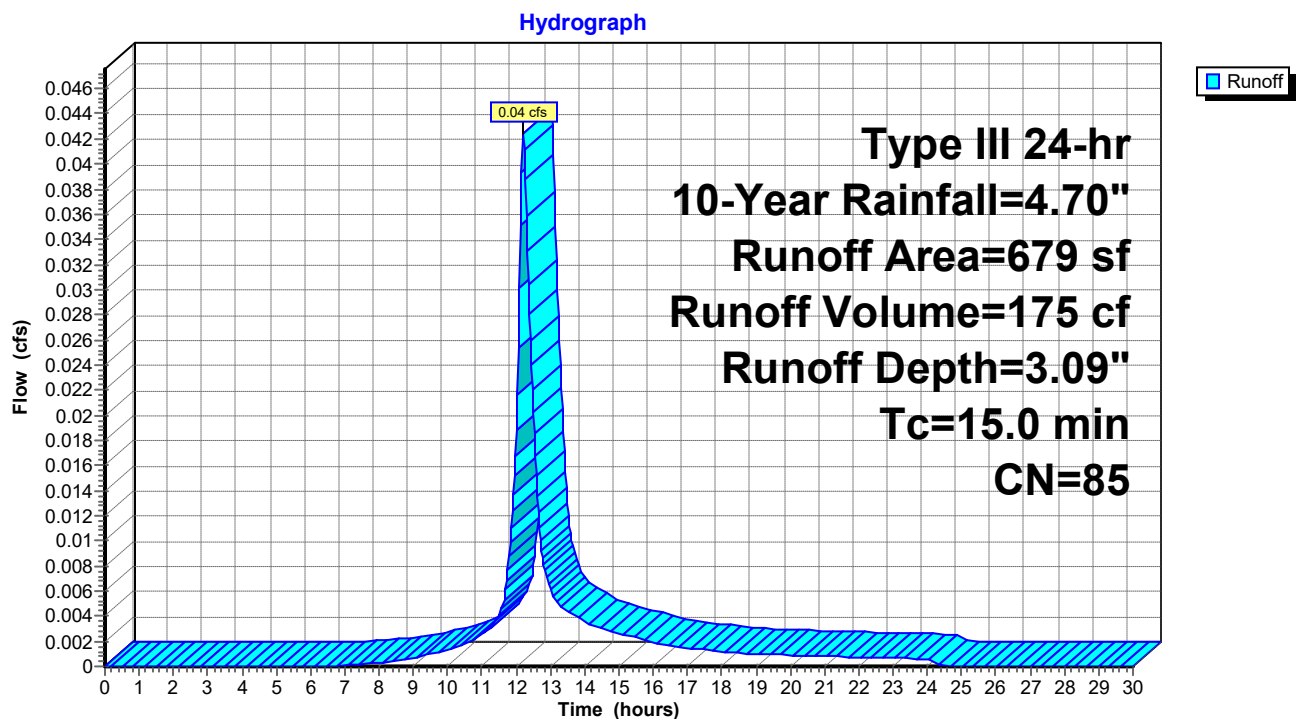
**Summary for Subcatchment 2S: PROPOSED PERMEABLE PAVERS**

Runoff = 0.04 cfs @ 12.20 hrs, Volume= 175 cf, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10-Year Rainfall=4.70"

	Area (sf)	CN	Description
*	679	85	Permeable Pavers
	679		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 2S: PROPOSED PERMEABLE PAVERS**

**PROPOSED**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 10-Year Rainfall=4.70"

Printed 3/23/2022

Page 16

**Summary for Subcatchment 4S: PROPOSED LANDSCAPE AREA**

Runoff = 0.02 cfs @ 12.13 hrs, Volume= 94 cf, Depth= 0.53"

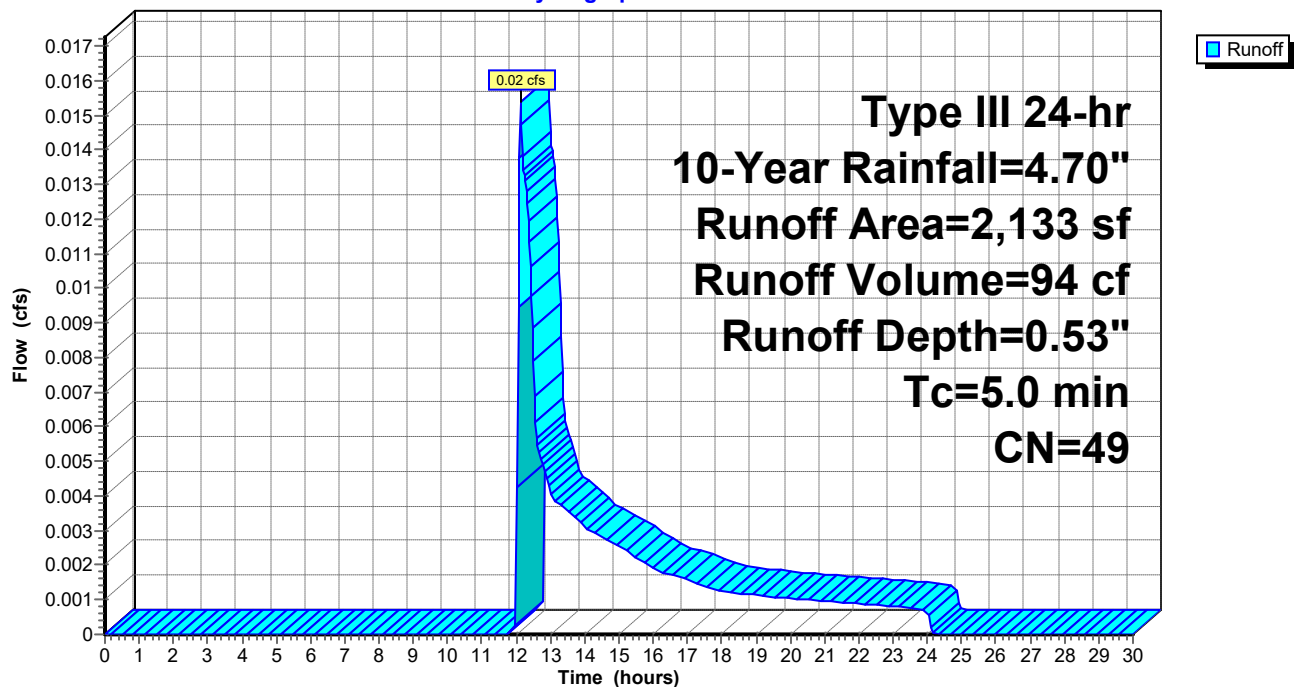
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
2,133	49	50-75% Grass cover, Fair, HSG A
2,133		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 4S: PROPOSED LANDSCAPE AREA**

Hydrograph



**PROPOSED**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 10-Year Rainfall=4.70"

Printed 3/23/2022

Page 17

**Summary for Subcatchment 6S: PROPOSED ROOF**

Runoff = 0.16 cfs @ 12.07 hrs, Volume= 547 cf, Depth= 4.46"

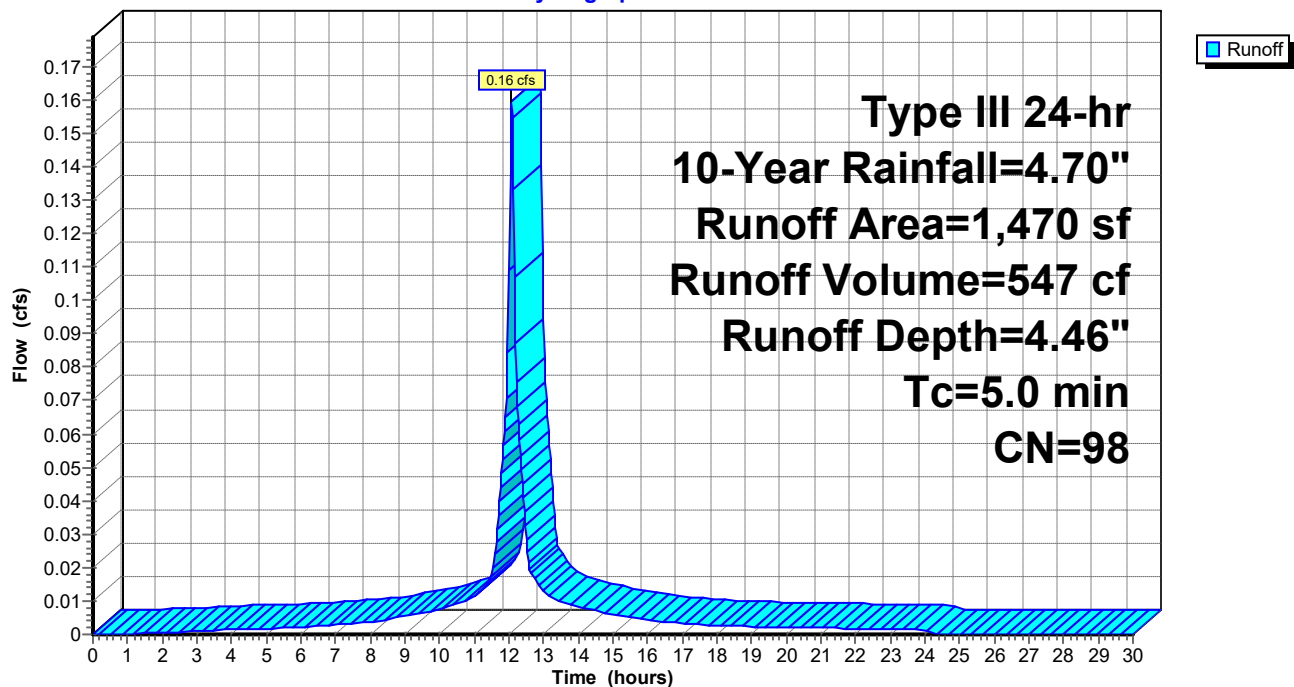
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
1,470	98	Roofs, HSG A
1,470		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 6S: PROPOSED ROOF**

Hydrograph



**PROPOSED**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 10-Year Rainfall=4.70"

Printed 3/23/2022

Page 18

**Summary for Subcatchment 8S: UNCONNECTED IMPERVIOUS**

Runoff = 0.04 cfs @ 12.07 hrs, Volume= 152 cf, Depth= 4.46"

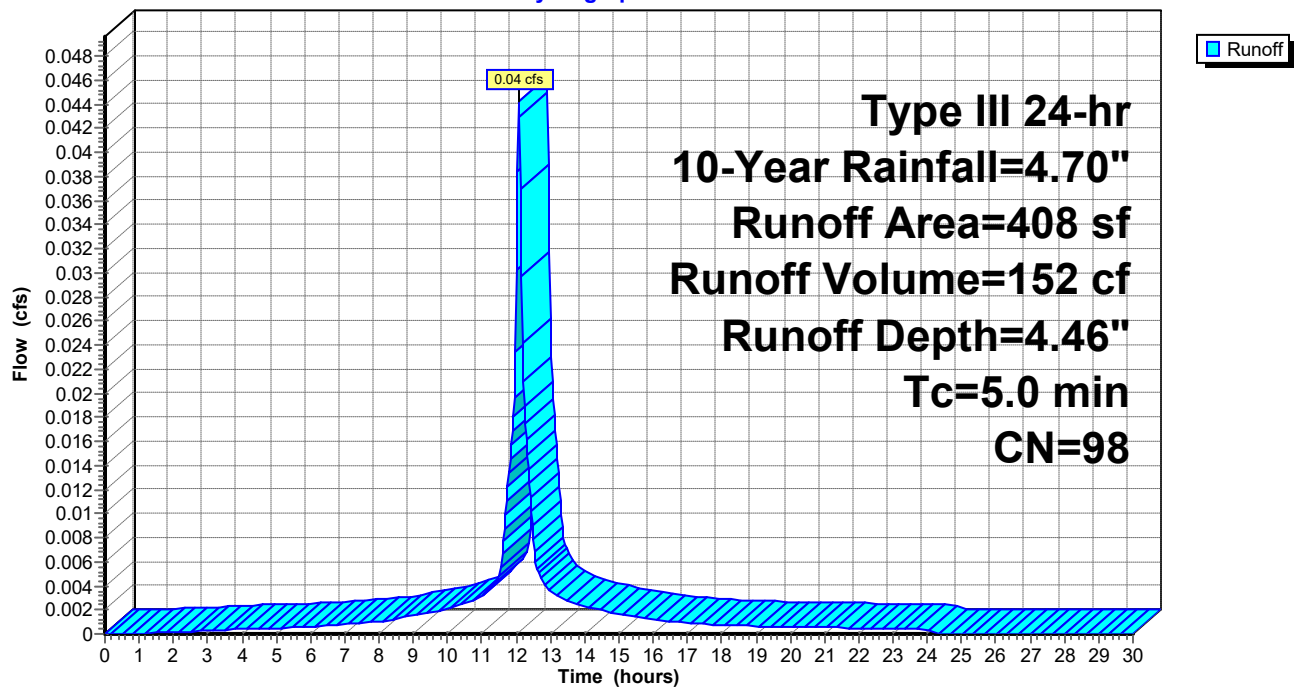
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
408	98	Unconnected pavement, HSG A
408		100.00% Impervious Area
408		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 8S: UNCONNECTED IMPERVIOUS**

Hydrograph



**PROPOSED**

Type III 24-hr 10-Year Rainfall=4.70"

Prepared by SPRUHAN ENGINEERING P.E.

Printed 3/23/2022

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Page 19

**Summary for Pond 7P: STORM TECH SYSTEM**

Inflow Area = 1,470 sf, 100.00% Impervious, Inflow Depth = 4.46" for 10-Year event  
 Inflow = 0.16 cfs @ 12.07 hrs, Volume= 547 cf  
 Outflow = 0.03 cfs @ 11.70 hrs, Volume= 547 cf, Atten= 81%, Lag= 0.0 min  
 Discarded = 0.03 cfs @ 11.70 hrs, Volume= 547 cf  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs

Peak Elev= 5.84' @ 12.50 hrs Surf.Area= 156 sf Storage= 128 cf

Plug-Flow detention time= 22.0 min calculated for 546 cf (100% of inflow)

Center-of-Mass det. time= 22.0 min ( 770.2 - 748.1 )

Volume	Invert	Avail.Storage	Storage Description
#1A	4.00'	185 cf	<b>7.08'W x 22.01'L x 4.00'H Field A</b> 624 cf Overall - 95 cf Embedded = 529 cf x 35.0% Voids
#2A	5.00'	95 cf	<b>ADS_StormTech SC-740</b> x 2 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 6.45 sf x 1 rows
#3	8.00'	15 cf	<b>Ponding</b> Listed below -Impervious
		295 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Cum.Store (cubic-feet)
8.00	0
9.00	10
9.20	15

Device	Routing	Invert	Outlet Devices
#1	Discarded	4.00'	<b>8.270 in/hr Exfiltration over Surface area</b>
#2	Primary	7.90'	<b>4.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Discarded OutFlow** Max=0.03 cfs @ 11.70 hrs HW=4.06' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=4.00' (Free Discharge)↑ **2=Orifice/Grate** ( Controls 0.00 cfs)

## PROPOSED

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 10-Year Rainfall=4.70"

Printed 3/23/2022

Page 20

### Pond 7P: STORM TECH SYSTEM - Chamber Wizard Field A

**Chamber Model = ADS\_StormTech SC-740 (ADS StormTech® SC-740 without end caps)**

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

Row Length Adjustment= +0.44' x 6.45 sf x 1 rows

2 Chambers/Row x 7.12' Long +0.44' Row Adjustment = 14.68' Row Length +44.0" End Stone x 2 = 22.01' Base Length

1 Rows x 51.0" Wide + 17.0" Side Stone x 2 = 7.08' Base Width

12.0" Base + 30.0" Chamber Height + 6.0" Cover = 4.00' Field Height

2 Chambers x 45.9 cf +0.44' Row Adjustment x 6.45 sf x 1 Rows = 94.7 cf Chamber Storage

623.7 cf Field - 94.7 cf Chambers = 529.0 cf Stone x 35.0% Voids = 185.1 cf Stone Storage

Chamber Storage + Stone Storage = 279.8 cf = 0.006 af

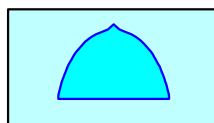
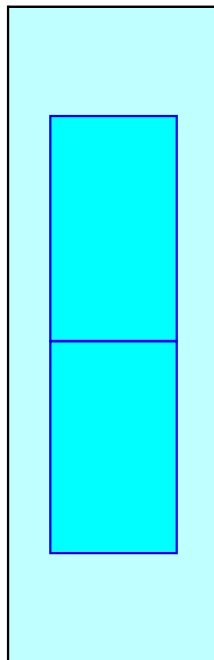
Overall Storage Efficiency = 44.9%

Overall System Size = 22.01' x 7.08' x 4.00'

2 Chambers

23.1 cy Field

19.6 cy Stone



## PROPOSED

Prepared by SPRUHAN ENGINEERING P.E.

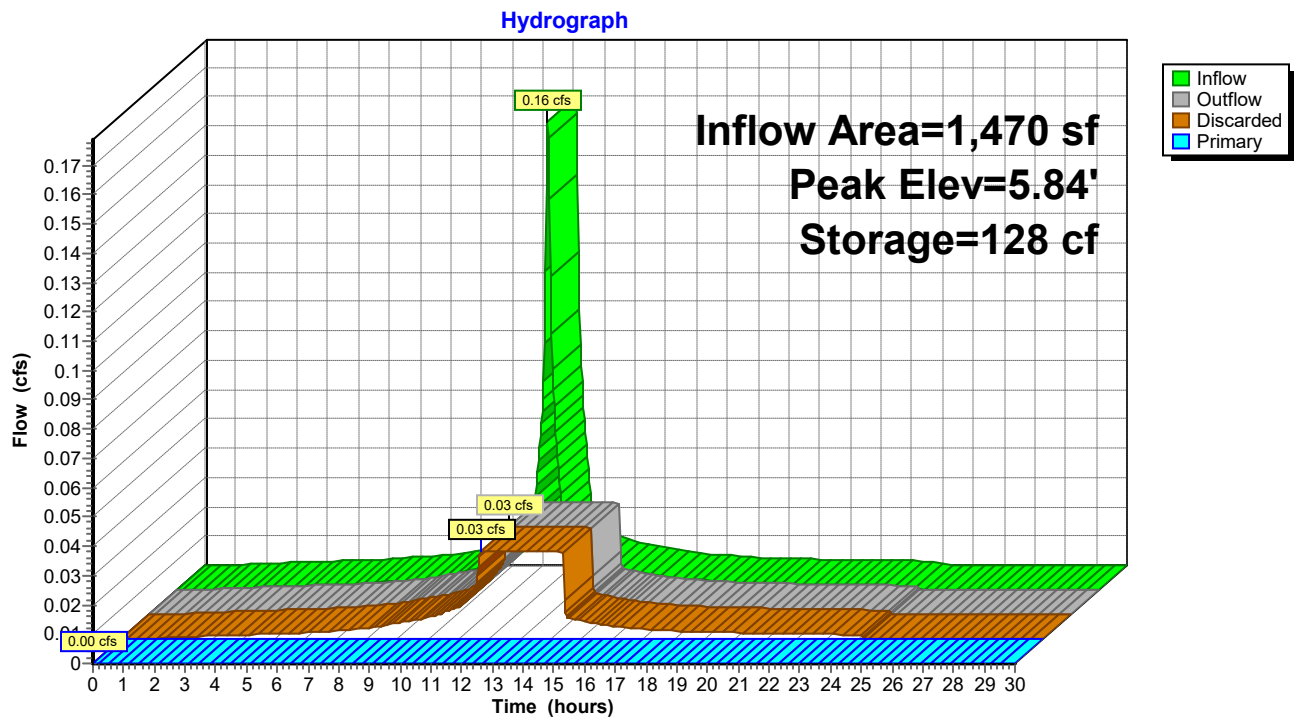
HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 10-Year Rainfall=4.70"

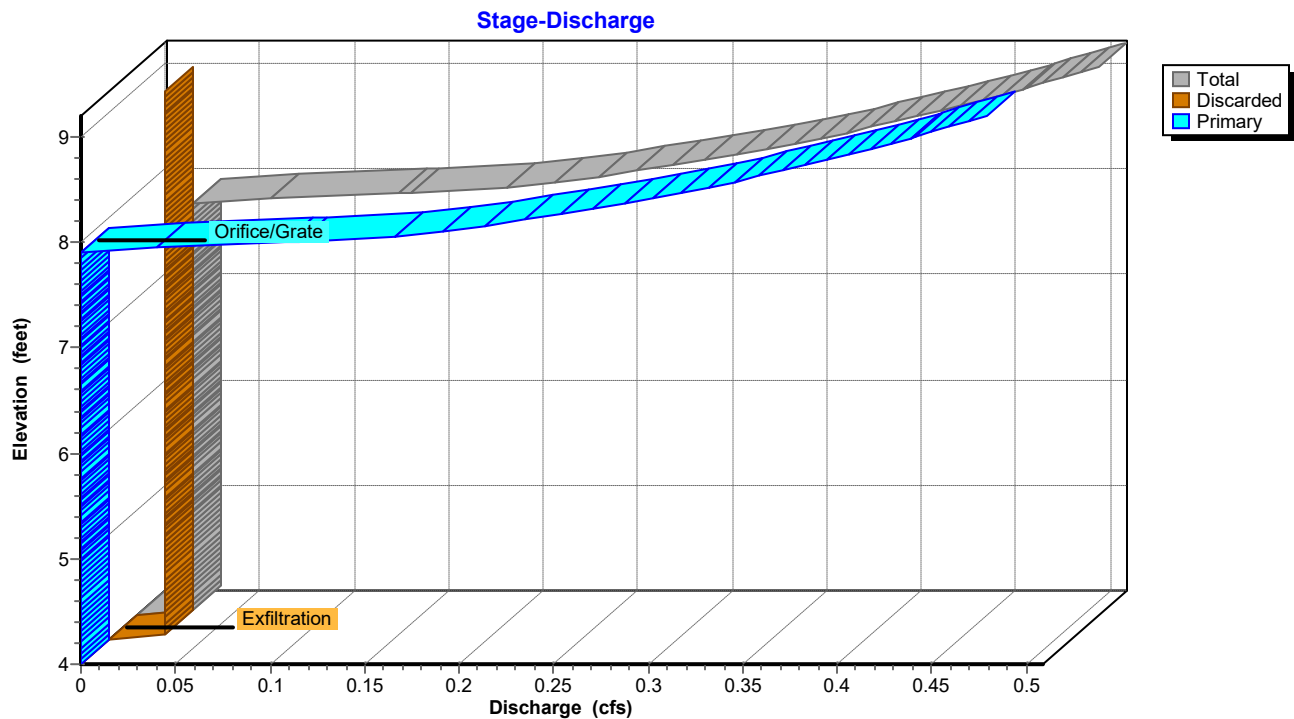
Printed 3/23/2022

Page 21

### Pond 7P: STORM TECH SYSTEM



### Pond 7P: STORM TECH SYSTEM



# PROPOSED

Prepared by SPRUHAN ENGINEERING P.E.

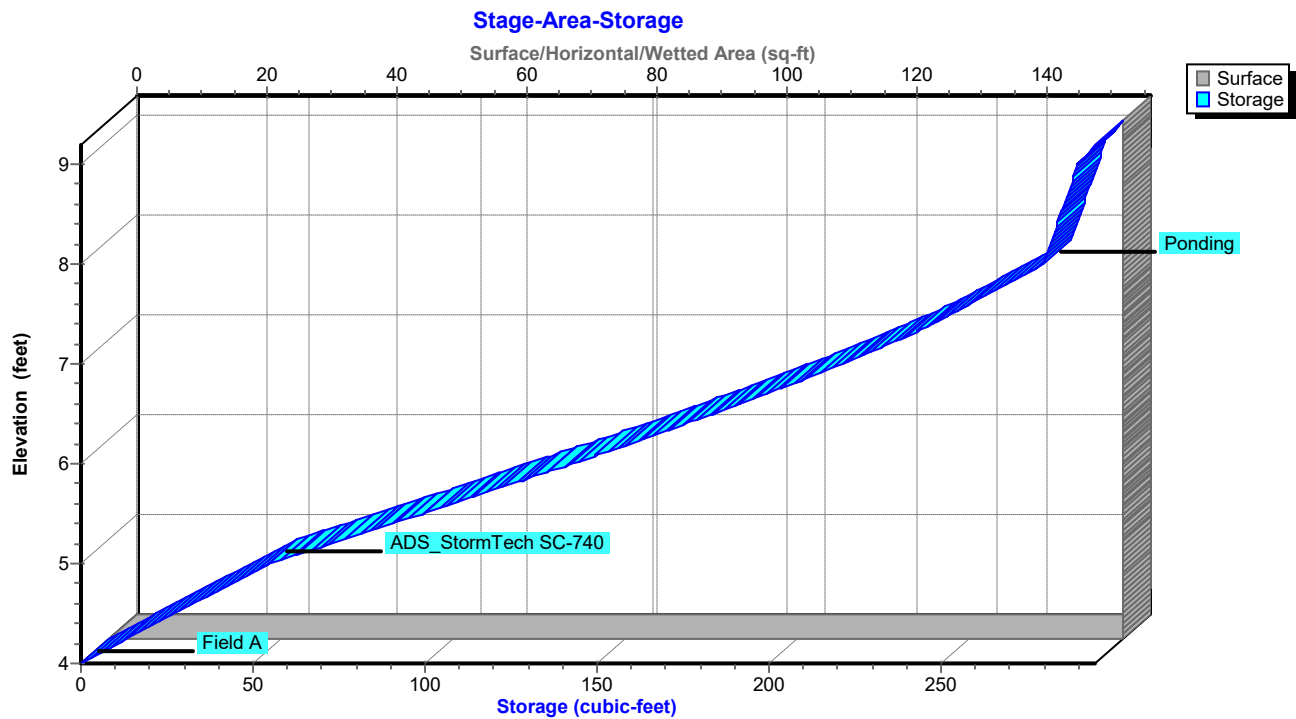
HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 10-Year Rainfall=4.70"

Printed 3/23/2022

Page 22

## Pond 7P: STORM TECH SYSTEM



## PROPOSED

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 10-Year Rainfall=4.70"

Printed 3/23/2022

Page 23

### Summary for Link 3L: PROPOSED

Inflow Area = 4,690 sf, 40.04% Impervious, Inflow Depth = 1.08" for 10-Year event

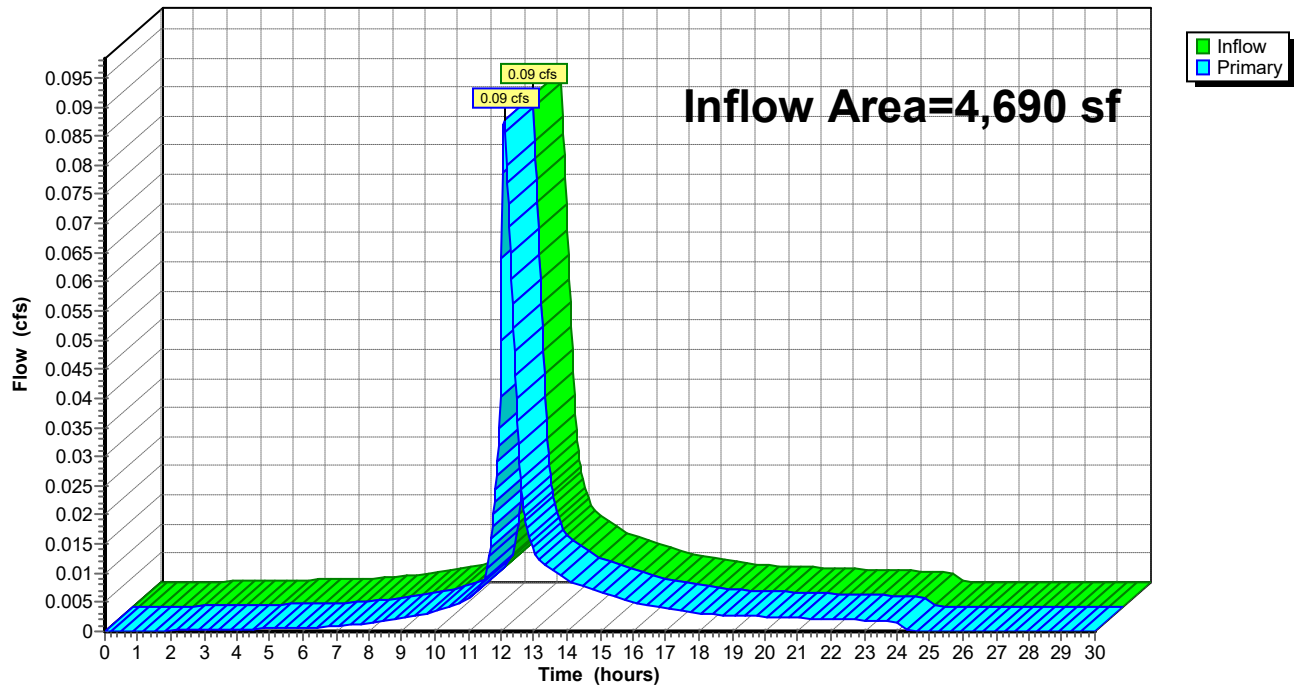
Inflow = 0.09 cfs @ 12.11 hrs, Volume= 420 cf

Primary = 0.09 cfs @ 12.11 hrs, Volume= 420 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs

### Link 3L: PROPOSED

Hydrograph



**PROPOSED***Type III 24-hr 25-Year Rainfall=5.50"*

Prepared by SPRUHAN ENGINEERING P.E.

Printed 3/23/2022

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Page 24

Time span=0.00-30.00 hrs, dt=0.03 hrs, 1001 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 2S: PROPOSED PERMEABLE** Runoff Area=679 sf 0.00% Impervious Runoff Depth=3.83"  
Tc=15.0 min CN=85 Runoff=0.05 cfs 217 cf

**Subcatchment 4S: PROPOSED LANDSCAPE** Runoff Area=2,133 sf 0.00% Impervious Runoff Depth=0.85"  
Tc=5.0 min CN=49 Runoff=0.03 cfs 150 cf

**Subcatchment 6S: PROPOSED ROOF** Runoff Area=1,470 sf 100.00% Impervious Runoff Depth=5.26"  
Tc=5.0 min CN=98 Runoff=0.19 cfs 645 cf

**Subcatchment 8S: UNCONNECTED** Runoff Area=408 sf 100.00% Impervious Runoff Depth=5.26"  
Tc=5.0 min CN=98 Runoff=0.05 cfs 179 cf

**Pond 7P: STORM TECH SYSTEM** Peak Elev=6.29' Storage=166 cf Inflow=0.19 cfs 645 cf  
Discarded=0.03 cfs 645 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 645 cf

**Link 3L: PROPOSED** Inflow=0.12 cfs 546 cf  
Primary=0.12 cfs 546 cf

**Total Runoff Area = 4,690 sf Runoff Volume = 1,191 cf Average Runoff Depth = 3.05"**  
**59.96% Pervious = 2,812 sf 40.04% Impervious = 1,878 sf**

**PROPOSED**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=5.50"

Printed 3/23/2022

Page 25

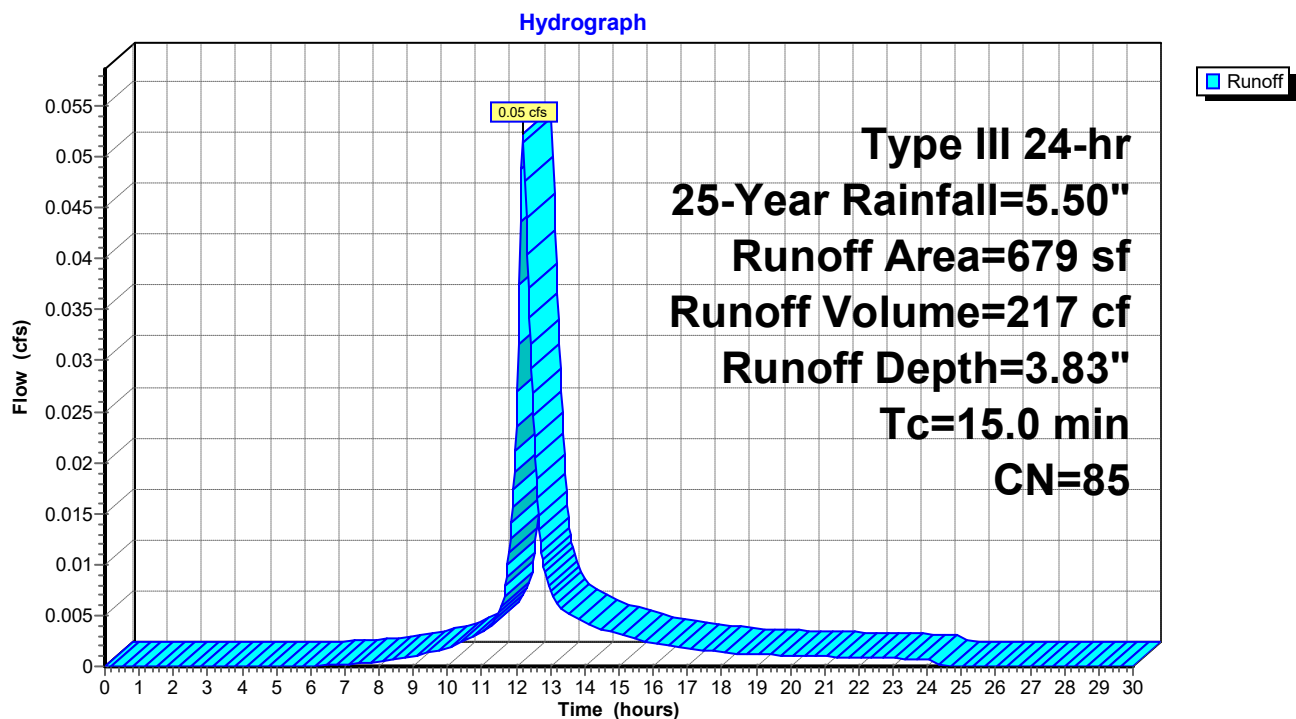
**Summary for Subcatchment 2S: PROPOSED PERMEABLE PAVERS**

Runoff = 0.05 cfs @ 12.20 hrs, Volume= 217 cf, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25-Year Rainfall=5.50"

	Area (sf)	CN	Description
*	679	85	Permeable Pavers
	679		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 2S: PROPOSED PERMEABLE PAVERS**

**PROPOSED**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=5.50"

Printed 3/23/2022

Page 26

**Summary for Subcatchment 4S: PROPOSED LANDSCAPE AREA**

Runoff = 0.03 cfs @ 12.10 hrs, Volume= 150 cf, Depth= 0.85"

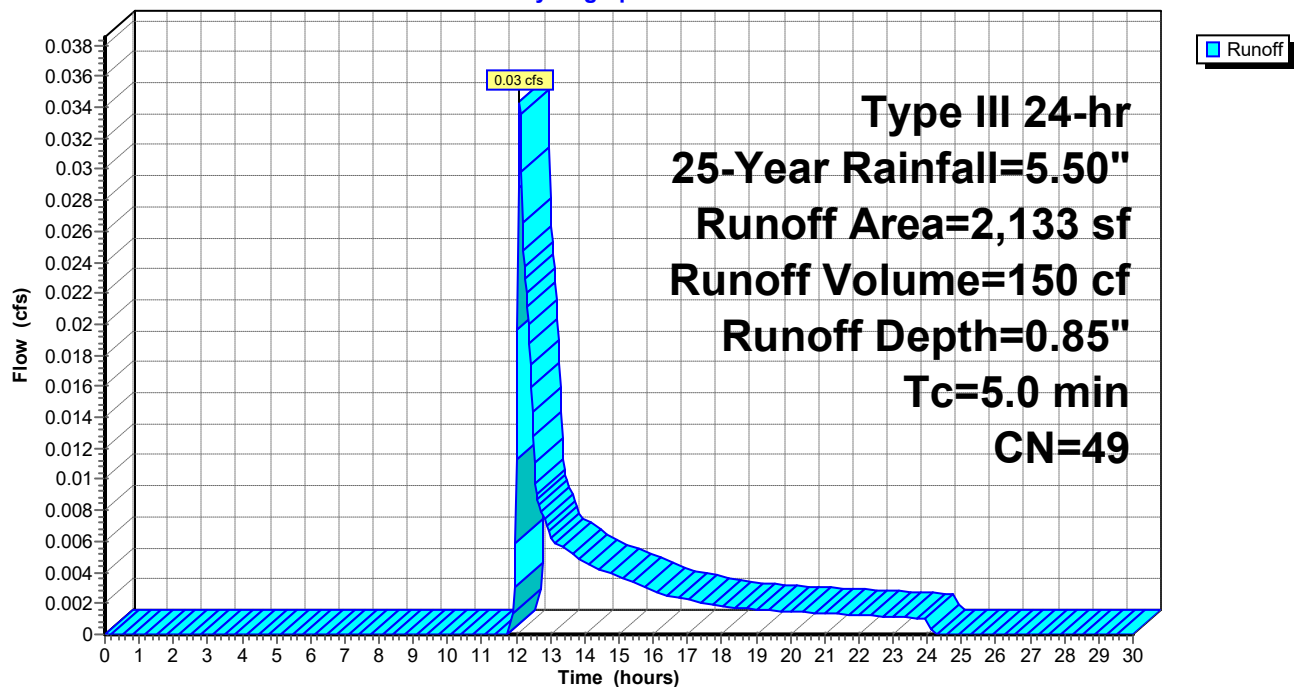
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
2,133	49	50-75% Grass cover, Fair, HSG A
2,133		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 4S: PROPOSED LANDSCAPE AREA**

Hydrograph



**PROPOSED**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=5.50"

Printed 3/23/2022

Page 27

**Summary for Subcatchment 6S: PROPOSED ROOF**

Runoff = 0.19 cfs @ 12.07 hrs, Volume= 645 cf, Depth= 5.26"

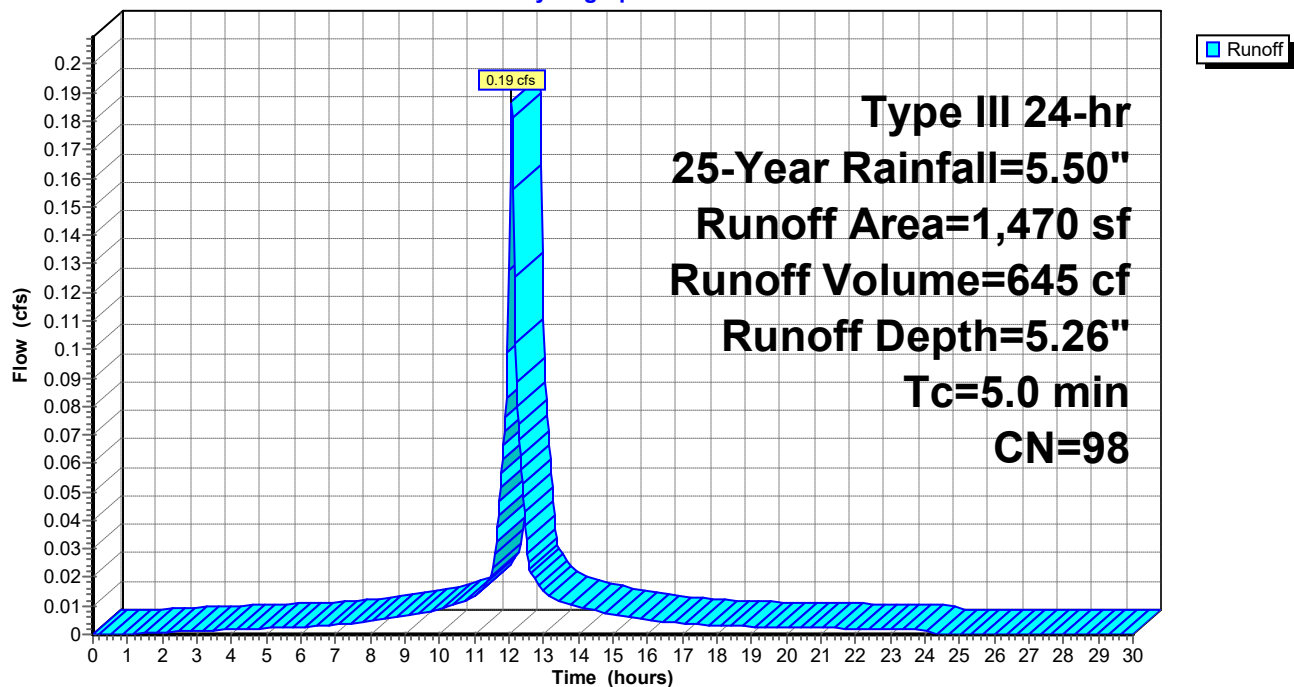
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
1,470	98	Roofs, HSG A
1,470		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 6S: PROPOSED ROOF**

Hydrograph



**PROPOSED**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=5.50"

Printed 3/23/2022

Page 28

**Summary for Subcatchment 8S: UNCONNECTED IMPERVIOUS**

Runoff = 0.05 cfs @ 12.07 hrs, Volume= 179 cf, Depth= 5.26"

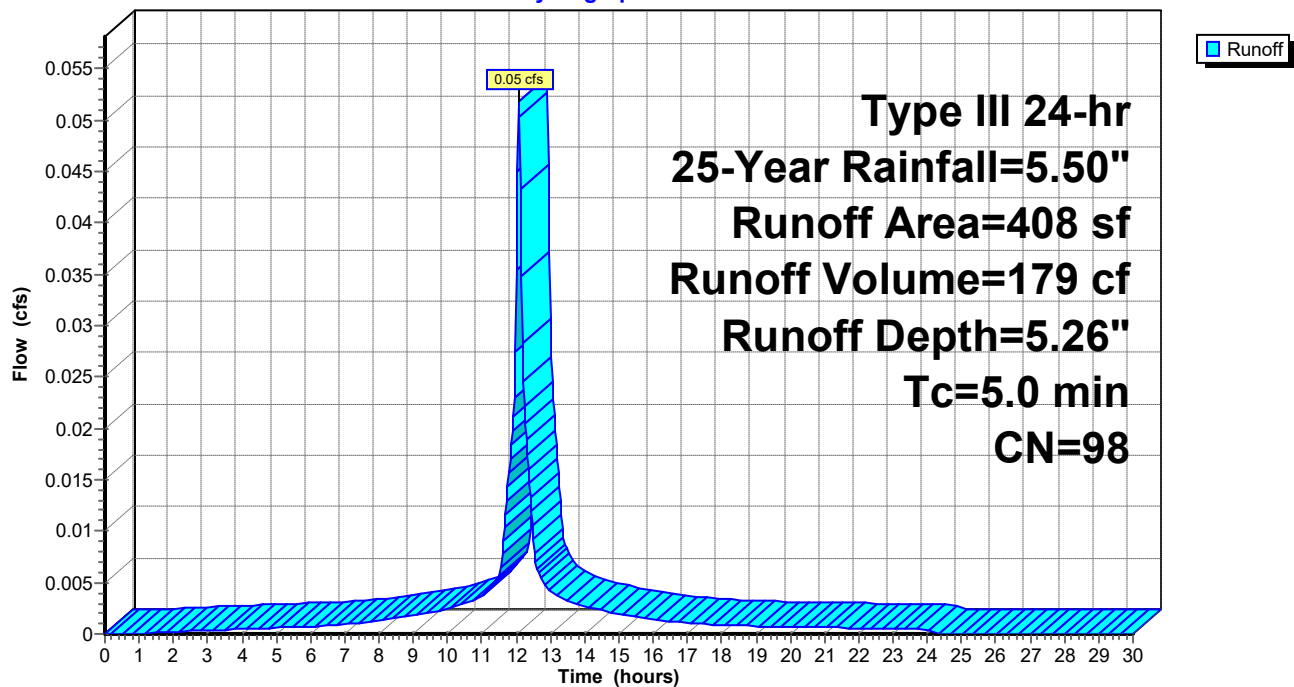
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
408	98	Unconnected pavement, HSG A
408		100.00% Impervious Area
408		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 8S: UNCONNECTED IMPERVIOUS**

Hydrograph



**PROPOSED**

Type III 24-hr 25-Year Rainfall=5.50"

Prepared by SPRUHAN ENGINEERING P.E.

Printed 3/23/2022

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Page 29

**Summary for Pond 7P: STORM TECH SYSTEM**

Inflow Area = 1,470 sf, 100.00% Impervious, Inflow Depth = 5.26" for 25-Year event  
 Inflow = 0.19 cfs @ 12.07 hrs, Volume= 645 cf  
 Outflow = 0.03 cfs @ 11.67 hrs, Volume= 645 cf, Atten= 84%, Lag= 0.0 min  
 Discarded = 0.03 cfs @ 11.67 hrs, Volume= 645 cf  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs

Peak Elev= 6.29' @ 12.53 hrs Surf.Area= 156 sf Storage= 166 cf

Plug-Flow detention time= 30.0 min calculated for 644 cf (100% of inflow)

Center-of-Mass det. time= 30.0 min ( 775.6 - 745.5 )

Volume	Invert	Avail.Storage	Storage Description
#1A	4.00'	185 cf	<b>7.08'W x 22.01'L x 4.00'H Field A</b> 624 cf Overall - 95 cf Embedded = 529 cf x 35.0% Voids
#2A	5.00'	95 cf	<b>ADS_StormTech SC-740</b> x 2 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 6.45 sf x 1 rows
#3	8.00'	15 cf	<b>Ponding</b> Listed below -Impervious
		295 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Cum.Store (cubic-feet)
8.00	0
9.00	10
9.20	15

Device	Routing	Invert	Outlet Devices
#1	Discarded	4.00'	<b>8.270 in/hr Exfiltration over Surface area</b>
#2	Primary	7.90'	<b>4.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Discarded OutFlow** Max=0.03 cfs @ 11.67 hrs HW=4.06' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=4.00' (Free Discharge)↑ **2=Orifice/Grate** ( Controls 0.00 cfs)

## PROPOSED

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=5.50"

Printed 3/23/2022

Page 30

### Pond 7P: STORM TECH SYSTEM - Chamber Wizard Field A

**Chamber Model = ADS\_StormTech SC-740 (ADS StormTech® SC-740 without end caps)**

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

Row Length Adjustment= +0.44' x 6.45 sf x 1 rows

2 Chambers/Row x 7.12' Long +0.44' Row Adjustment = 14.68' Row Length +44.0" End Stone x 2 = 22.01' Base Length

1 Rows x 51.0" Wide + 17.0" Side Stone x 2 = 7.08' Base Width

12.0" Base + 30.0" Chamber Height + 6.0" Cover = 4.00' Field Height

2 Chambers x 45.9 cf +0.44' Row Adjustment x 6.45 sf x 1 Rows = 94.7 cf Chamber Storage

623.7 cf Field - 94.7 cf Chambers = 529.0 cf Stone x 35.0% Voids = 185.1 cf Stone Storage

Chamber Storage + Stone Storage = 279.8 cf = 0.006 af

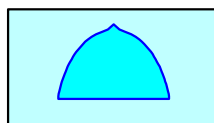
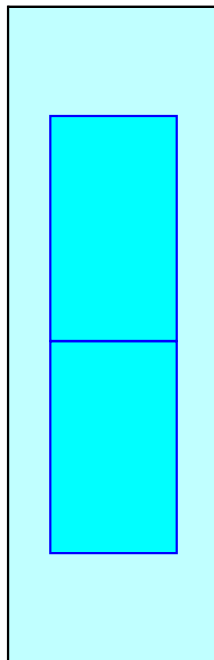
Overall Storage Efficiency = 44.9%

Overall System Size = 22.01' x 7.08' x 4.00'

2 Chambers

23.1 cy Field

19.6 cy Stone



# PROPOSED

Prepared by SPRUHAN ENGINEERING P.E.

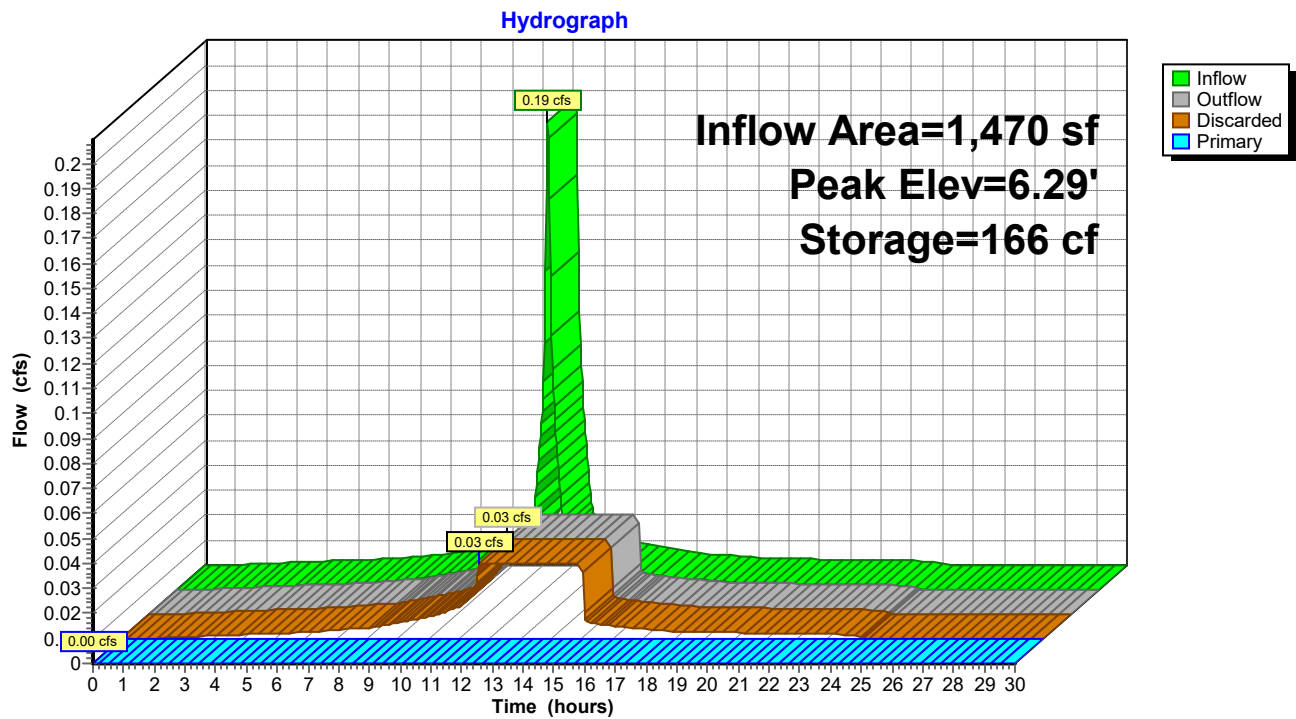
HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=5.50"

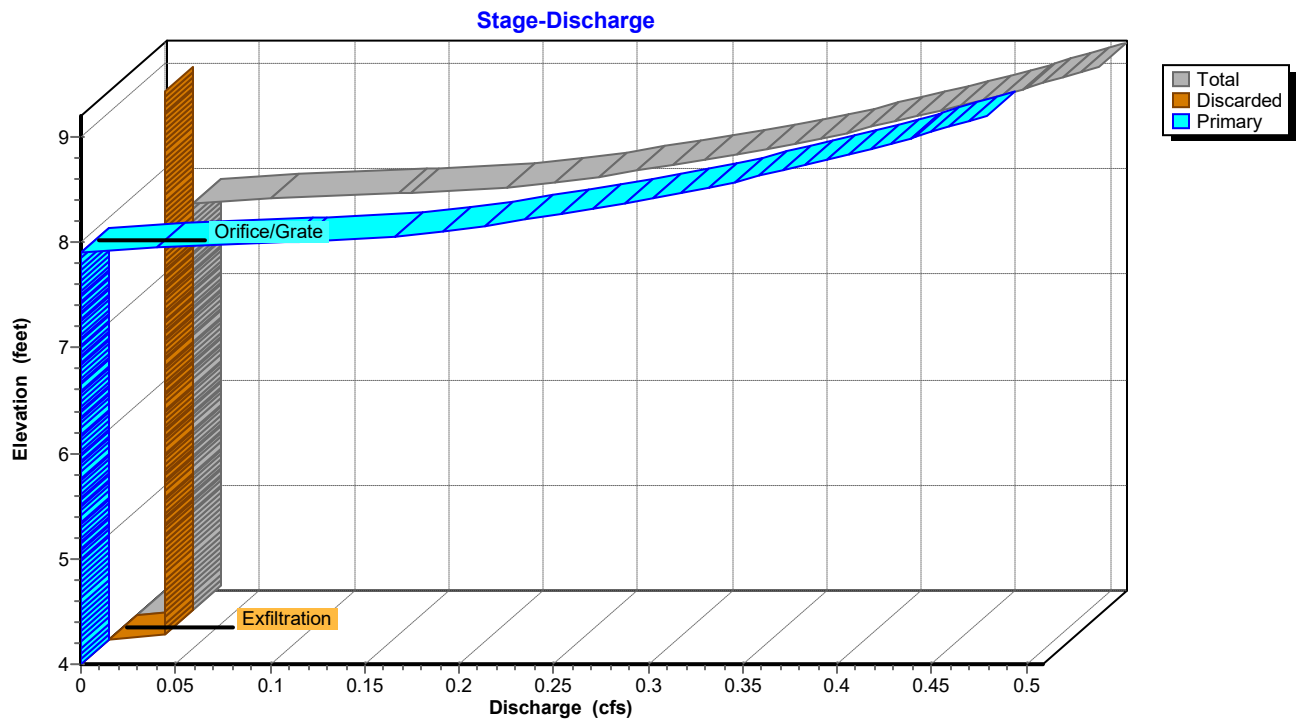
Printed 3/23/2022

Page 31

## Pond 7P: STORM TECH SYSTEM



## Pond 7P: STORM TECH SYSTEM



# PROPOSED

Prepared by SPRUHAN ENGINEERING P.E.

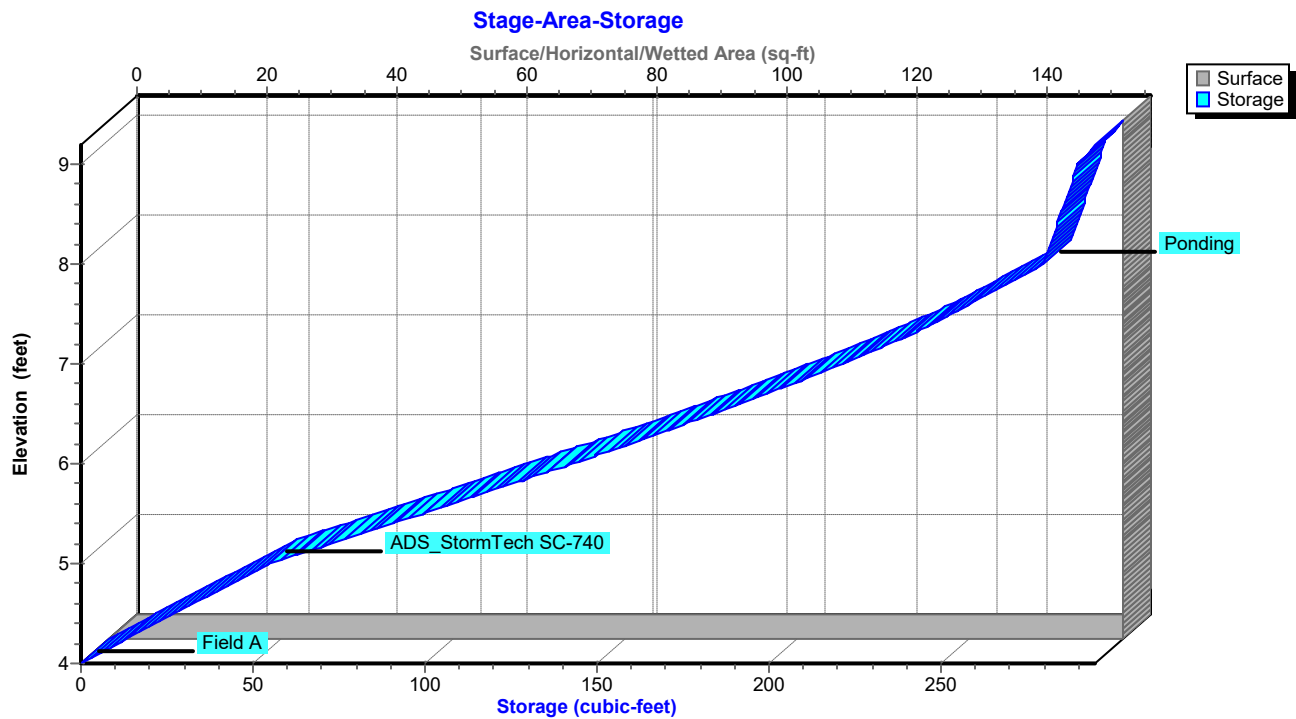
HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=5.50"

Printed 3/23/2022

Page 32

## Pond 7P: STORM TECH SYSTEM



## PROPOSED

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 25-Year Rainfall=5.50"

Printed 3/23/2022

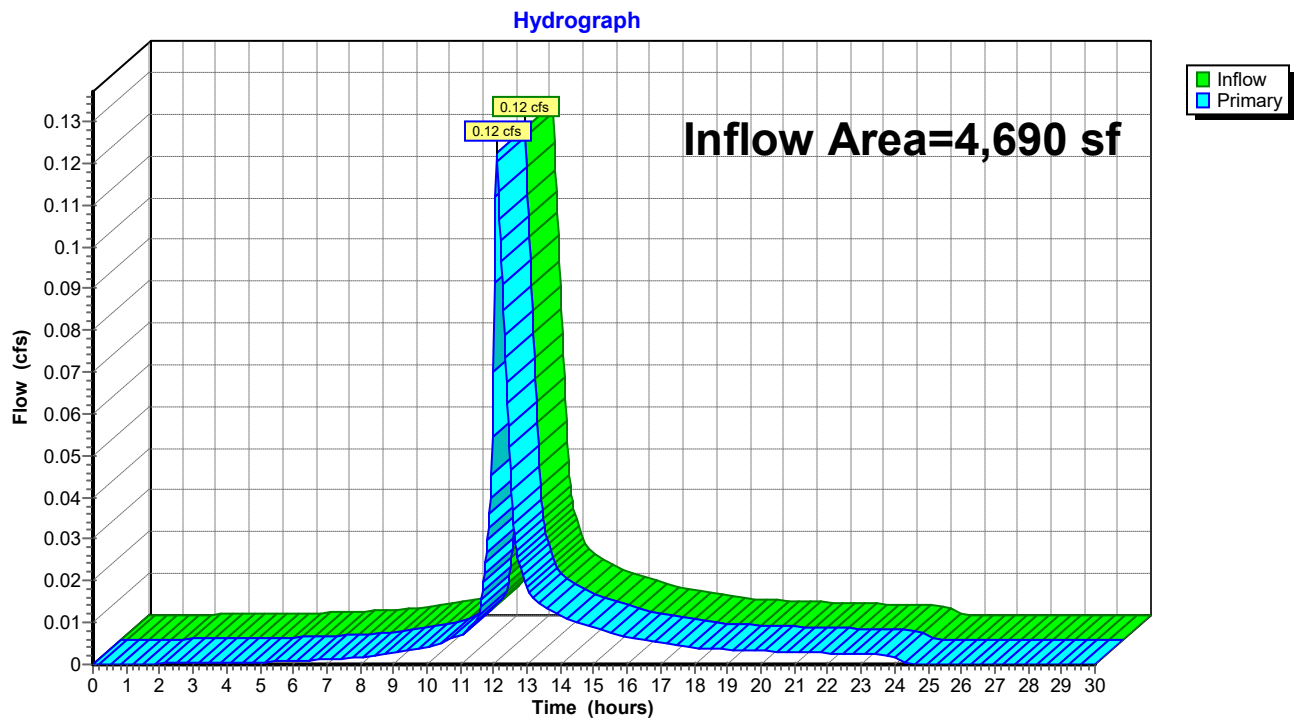
Page 33

### Summary for Link 3L: PROPOSED

Inflow Area = 4,690 sf, 40.04% Impervious, Inflow Depth = 1.40" for 25-Year event  
Inflow = 0.12 cfs @ 12.10 hrs, Volume= 546 cf  
Primary = 0.12 cfs @ 12.10 hrs, Volume= 546 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs

### Link 3L: PROPOSED



**PROPOSED***Type III 24-hr 100-Year Rainfall=6.50"*

Prepared by SPRUHAN ENGINEERING P.E.

Printed 3/23/2022

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Page 34

Time span=0.00-30.00 hrs, dt=0.03 hrs, 1001 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 2S: PROPOSED PERMEABLE** Runoff Area=679 sf 0.00% Impervious Runoff Depth=4.78"  
Tc=15.0 min CN=85 Runoff=0.06 cfs 270 cf

**Subcatchment 4S: PROPOSED LANDSCAPE** Runoff Area=2,133 sf 0.00% Impervious Runoff Depth=1.32"  
Tc=5.0 min CN=49 Runoff=0.06 cfs 234 cf

**Subcatchment 6S: PROPOSED ROOF** Runoff Area=1,470 sf 100.00% Impervious Runoff Depth=6.26"  
Tc=5.0 min CN=98 Runoff=0.22 cfs 767 cf

**Subcatchment 8S: UNCONNECTED** Runoff Area=408 sf 100.00% Impervious Runoff Depth=6.26"  
Tc=5.0 min CN=98 Runoff=0.06 cfs 213 cf

**Pond 7P: STORM TECH SYSTEM** Peak Elev=6.91' Storage=215 cf Inflow=0.22 cfs 767 cf  
Discarded=0.03 cfs 767 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 767 cf

**Link 3L: PROPOSED** Inflow=0.17 cfs 717 cf  
Primary=0.17 cfs 717 cf

**Total Runoff Area = 4,690 sf Runoff Volume = 1,484 cf Average Runoff Depth = 3.80"**  
**59.96% Pervious = 2,812 sf 40.04% Impervious = 1,878 sf**

**PROPOSED**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 100-Year Rainfall=6.50"

Printed 3/23/2022

Page 35

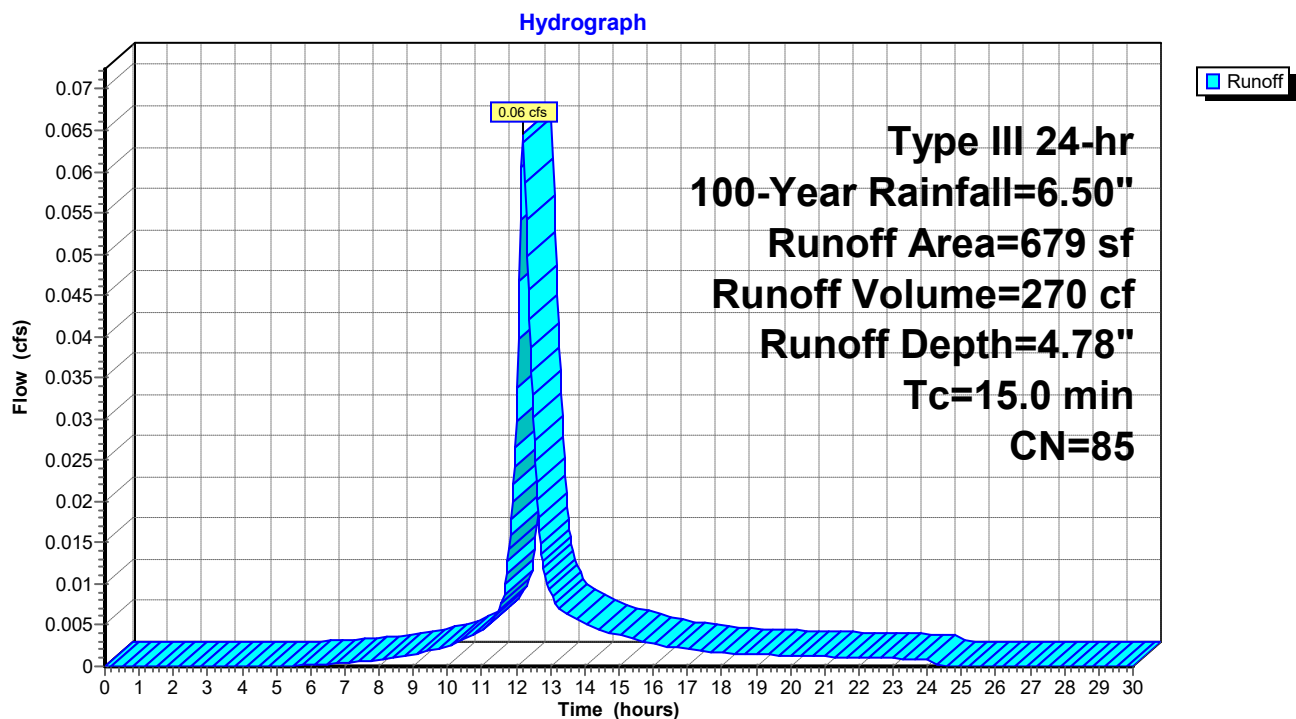
**Summary for Subcatchment 2S: PROPOSED PERMEABLE PAVERS**

Runoff = 0.06 cfs @ 12.20 hrs, Volume= 270 cf, Depth= 4.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

	Area (sf)	CN	Description
*	679	85	Permeable Pavers
	679		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

**Subcatchment 2S: PROPOSED PERMEABLE PAVERS**

**PROPOSED**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 100-Year Rainfall=6.50"

Printed 3/23/2022

Page 36

**Summary for Subcatchment 4S: PROPOSED LANDSCAPE AREA**

Runoff = 0.06 cfs @ 12.09 hrs, Volume= 234 cf, Depth= 1.32"

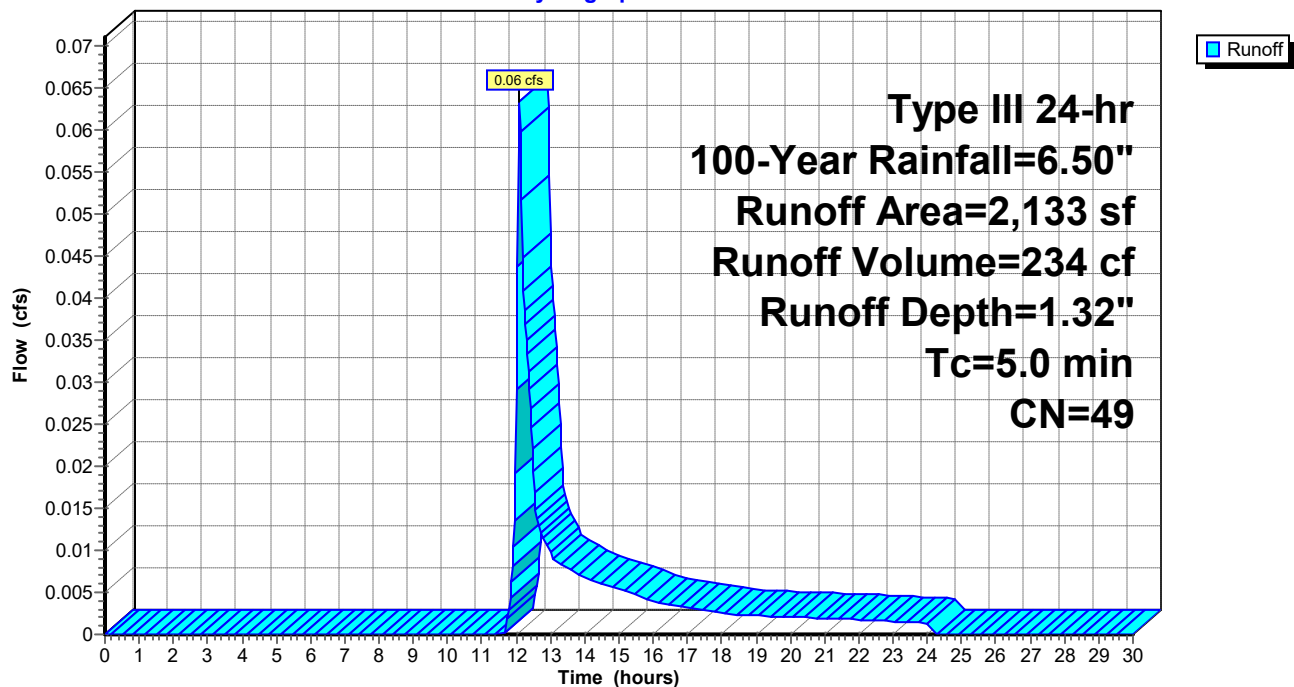
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
2,133	49	50-75% Grass cover, Fair, HSG A
2,133		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 4S: PROPOSED LANDSCAPE AREA**

Hydrograph



**PROPOSED**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 100-Year Rainfall=6.50"

Printed 3/23/2022

Page 37

**Summary for Subcatchment 6S: PROPOSED ROOF**

Runoff = 0.22 cfs @ 12.07 hrs, Volume= 767 cf, Depth= 6.26"

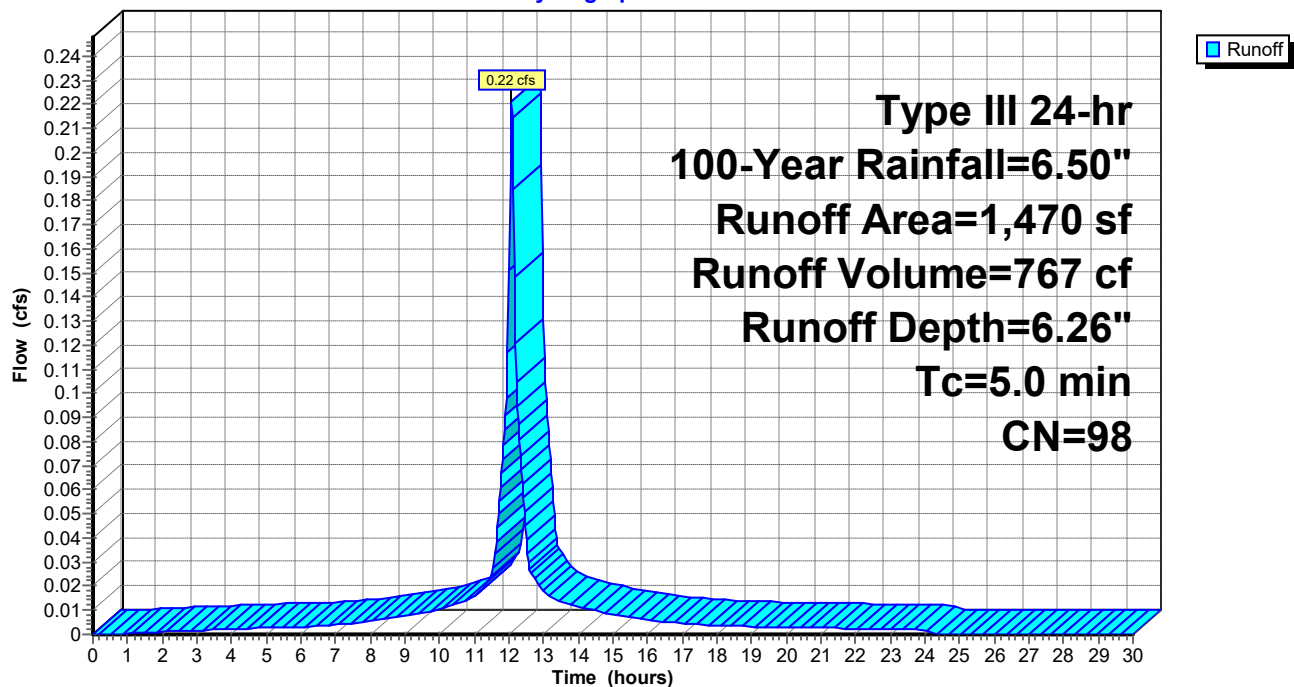
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
1,470	98	Roofs, HSG A
1,470		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 6S: PROPOSED ROOF**

Hydrograph



**PROPOSED**

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 100-Year Rainfall=6.50"

Printed 3/23/2022

Page 38

**Summary for Subcatchment 8S: UNCONNECTED IMPERVIOUS**

Runoff = 0.06 cfs @ 12.07 hrs, Volume= 213 cf, Depth= 6.26"

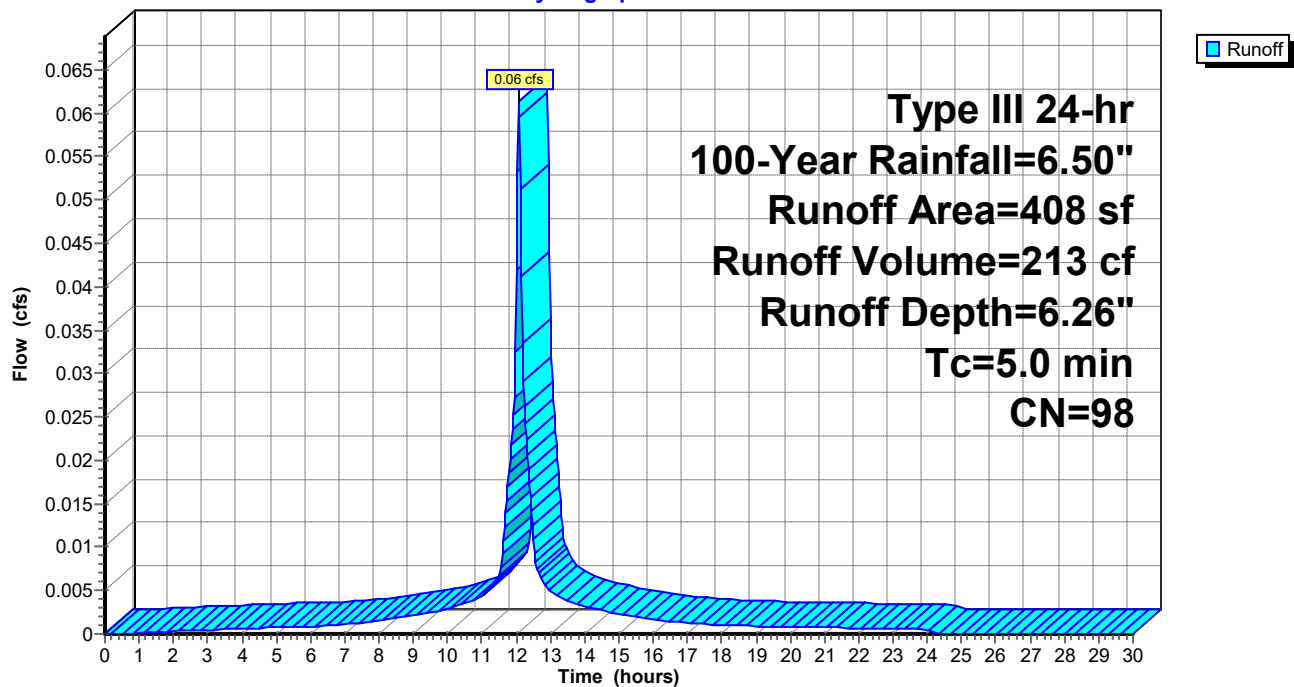
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs  
Type III 24-hr 100-Year Rainfall=6.50"

Area (sf)	CN	Description
408	98	Unconnected pavement, HSG A
408		100.00% Impervious Area
408		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

**Subcatchment 8S: UNCONNECTED IMPERVIOUS**

Hydrograph



**PROPOSED**

Type III 24-hr 100-Year Rainfall=6.50"

Prepared by SPRUHAN ENGINEERING P.E.

Printed 3/23/2022

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Page 39

**Summary for Pond 7P: STORM TECH SYSTEM**

Inflow Area = 1,470 sf, 100.00% Impervious, Inflow Depth = 6.26" for 100-Year event  
 Inflow = 0.22 cfs @ 12.07 hrs, Volume= 767 cf  
 Outflow = 0.03 cfs @ 11.61 hrs, Volume= 767 cf, Atten= 87%, Lag= 0.0 min  
 Discarded = 0.03 cfs @ 11.61 hrs, Volume= 767 cf  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs

Peak Elev= 6.91' @ 12.57 hrs Surf.Area= 156 sf Storage= 215 cf

Plug-Flow detention time= 41.3 min calculated for 766 cf (100% of inflow)

Center-of-Mass det. time= 41.2 min ( 784.3 - 743.1 )

Volume	Invert	Avail.Storage	Storage Description
#1A	4.00'	185 cf	<b>7.08'W x 22.01'L x 4.00'H Field A</b> 624 cf Overall - 95 cf Embedded = 529 cf x 35.0% Voids
#2A	5.00'	95 cf	<b>ADS_StormTech SC-740</b> x 2 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 6.45 sf x 1 rows
#3	8.00'	15 cf	<b>Ponding</b> Listed below -Impervious
		295 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Cum.Store (cubic-feet)
8.00	0
9.00	10
9.20	15

Device	Routing	Invert	Outlet Devices
#1	Discarded	4.00'	<b>8.270 in/hr Exfiltration over Surface area</b>
#2	Primary	7.90'	<b>4.0" Horiz. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Discarded OutFlow** Max=0.03 cfs @ 11.61 hrs HW=4.05' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=4.00' (Free Discharge)↑ **2=Orifice/Grate** ( Controls 0.00 cfs)

## PROPOSED

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 100-Year Rainfall=6.50"

Printed 3/23/2022

Page 40

### Pond 7P: STORM TECH SYSTEM - Chamber Wizard Field A

**Chamber Model = ADS\_StormTech SC-740 (ADS StormTech® SC-740 without end caps)**

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

Row Length Adjustment= +0.44' x 6.45 sf x 1 rows

2 Chambers/Row x 7.12' Long +0.44' Row Adjustment = 14.68' Row Length +44.0" End Stone x 2 = 22.01' Base Length

1 Rows x 51.0" Wide + 17.0" Side Stone x 2 = 7.08' Base Width

12.0" Base + 30.0" Chamber Height + 6.0" Cover = 4.00' Field Height

2 Chambers x 45.9 cf +0.44' Row Adjustment x 6.45 sf x 1 Rows = 94.7 cf Chamber Storage

623.7 cf Field - 94.7 cf Chambers = 529.0 cf Stone x 35.0% Voids = 185.1 cf Stone Storage

Chamber Storage + Stone Storage = 279.8 cf = 0.006 af

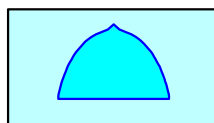
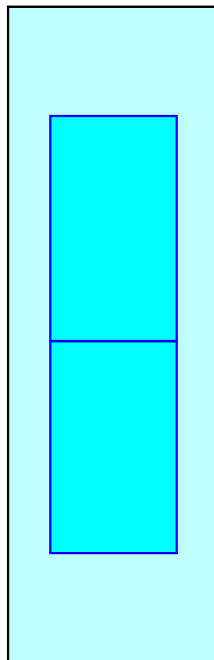
Overall Storage Efficiency = 44.9%

Overall System Size = 22.01' x 7.08' x 4.00'

2 Chambers

23.1 cy Field

19.6 cy Stone



## PROPOSED

Prepared by SPRUHAN ENGINEERING P.E.

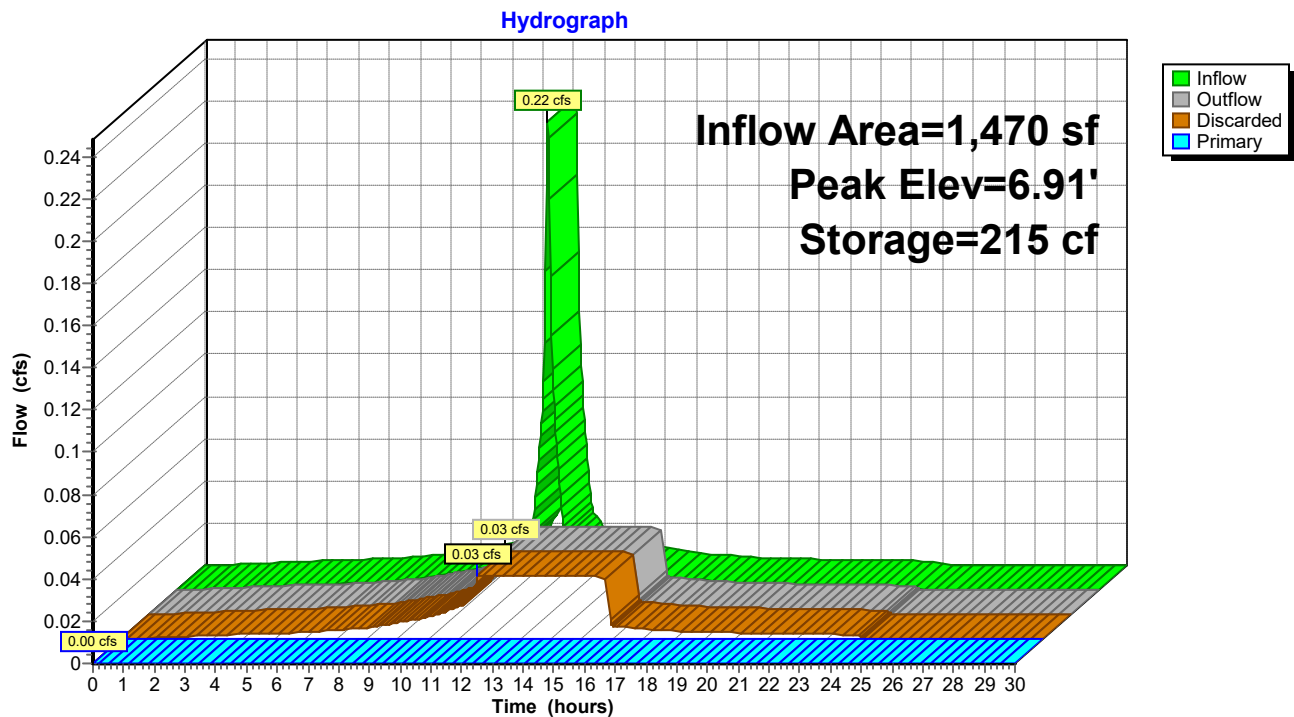
HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 100-Year Rainfall=6.50"

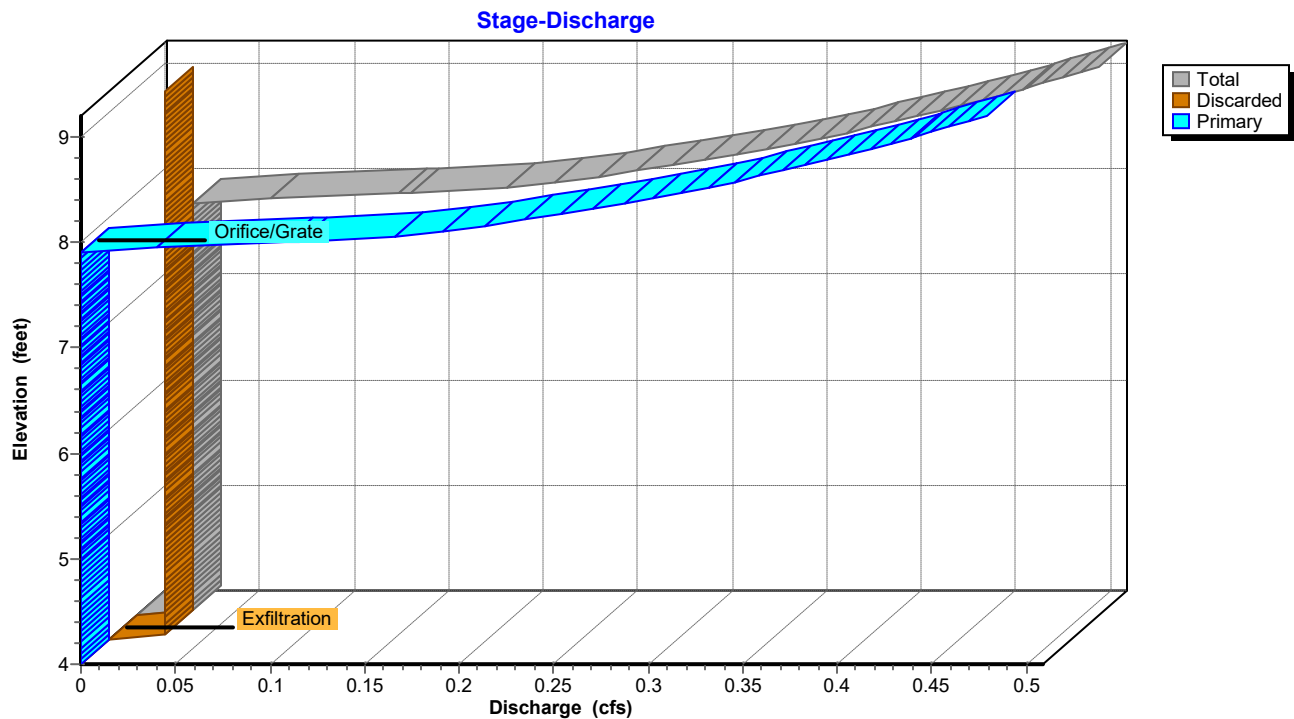
Printed 3/23/2022

Page 41

### Pond 7P: STORM TECH SYSTEM



### Pond 7P: STORM TECH SYSTEM



# PROPOSED

Prepared by SPRUHAN ENGINEERING P.E.

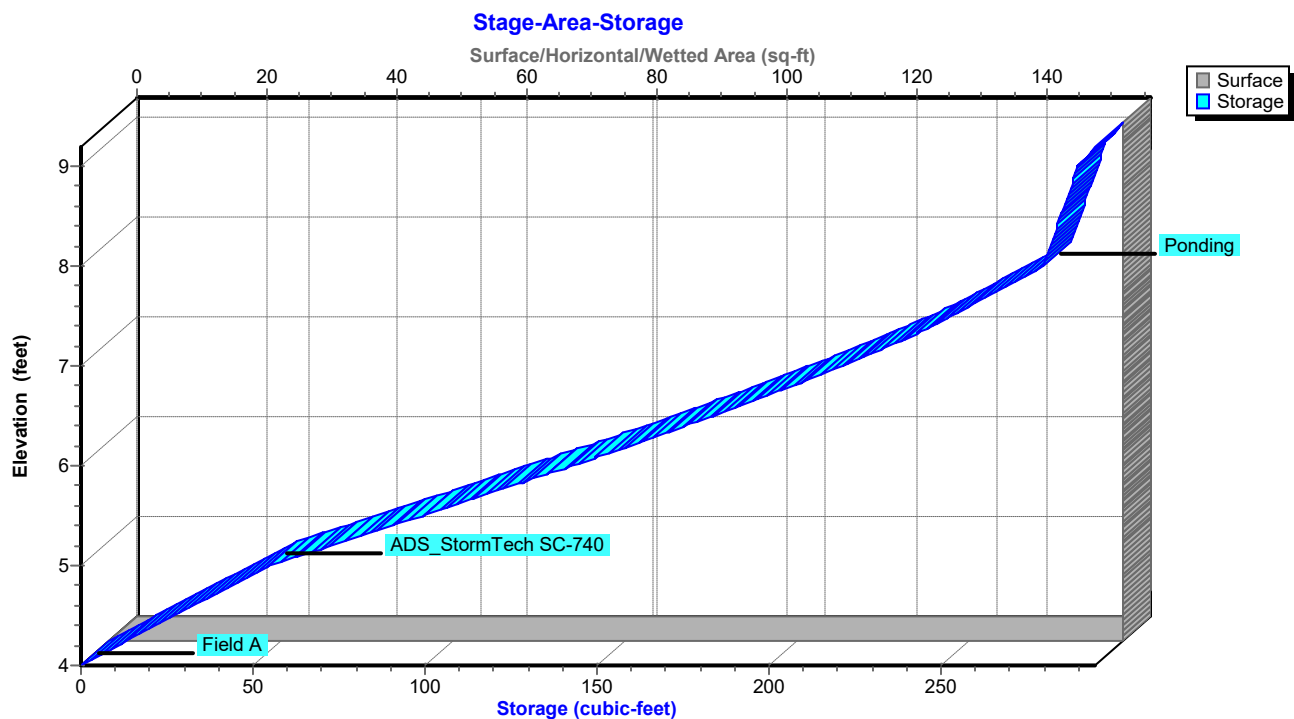
HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 100-Year Rainfall=6.50"

Printed 3/23/2022

Page 42

## Pond 7P: STORM TECH SYSTEM



## PROPOSED

Prepared by SPRUHAN ENGINEERING P.E.

HydroCAD® 10.00-25 s/n 09067 © 2019 HydroCAD Software Solutions LLC

Type III 24-hr 100-Year Rainfall=6.50"

Printed 3/23/2022

Page 43

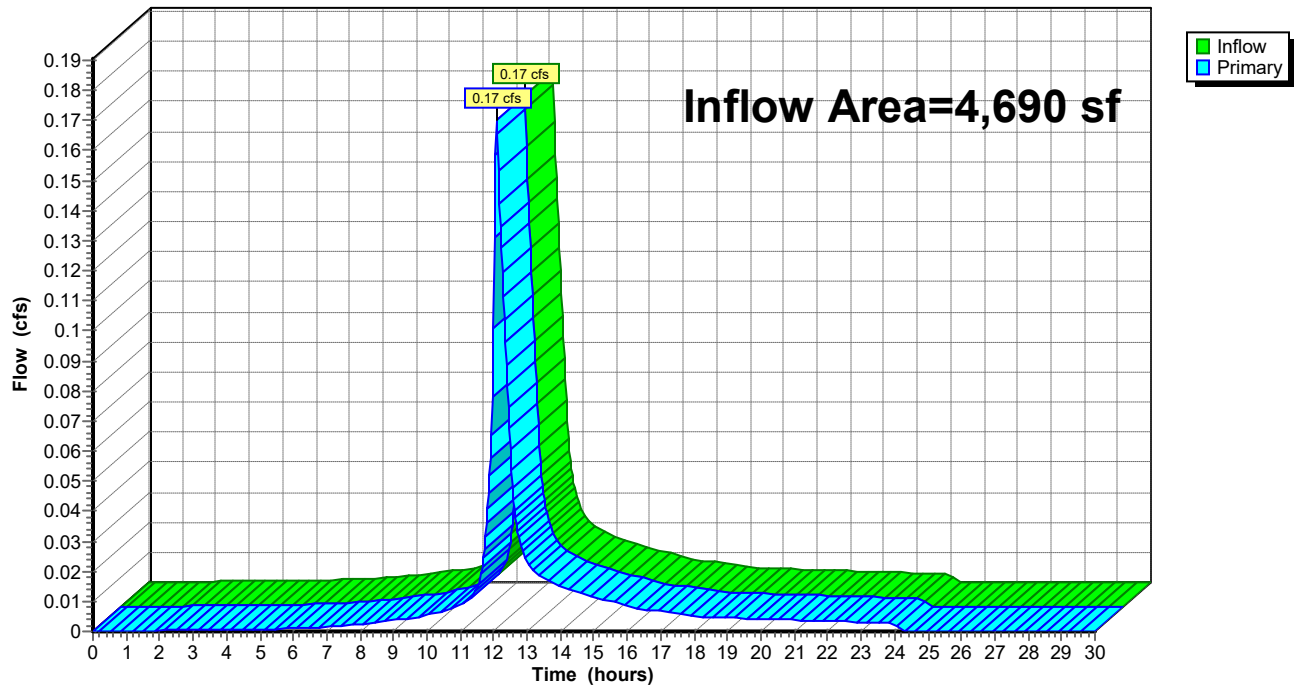
### Summary for Link 3L: PROPOSED

Inflow Area = 4,690 sf, 40.04% Impervious, Inflow Depth = 1.83" for 100-Year event  
Inflow = 0.17 cfs @ 12.10 hrs, Volume= 717 cf  
Primary = 0.17 cfs @ 12.10 hrs, Volume= 717 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.03 hrs

### Link 3L: PROPOSED

Hydrograph




## **Appendix B – Soils Information**

# Custom Soil Resource Report Soil Map




## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)


### Soils


 Soil Map Unit Polygons


 Soil Map Unit Lines


 Soil Map Unit Points

### Special Point Features

 Blowout

 Borrow Pit


 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot


 Sinkhole


 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot


 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

### Water Features

 Streams and Canals


### Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL:  
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts  
Survey Area Data: Version 21, Sep 2, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 13, 2020—Sep 15, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	0.1	100.0%
<b>Totals for Area of Interest</b>		<b>0.1</b>	<b>100.0%</b>

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## Middlesex County, Massachusetts

### 626B—Merrimac-Urban land complex, 0 to 8 percent slopes

#### Map Unit Setting

*National map unit symbol:* 2tyr9  
*Elevation:* 0 to 820 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 250 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Merrimac and similar soils:* 45 percent  
*Urban land:* 40 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Merrimac

##### Setting

*Landform:* Outwash plains, outwash terraces, moraines, eskers, kames  
*Landform position (two-dimensional):* Backslope, footslope, summit, shoulder  
*Landform position (three-dimensional):* Side slope, crest, riser, tread  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

##### Typical profile

*Ap - 0 to 10 inches:* fine sandy loam  
*Bw1 - 10 to 22 inches:* fine sandy loam  
*Bw2 - 22 to 26 inches:* stratified gravel to gravelly loamy sand  
*2C - 26 to 65 inches:* stratified gravel to very gravelly sand

##### Properties and qualities

*Slope:* 0 to 8 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Somewhat excessively drained  
*Runoff class:* Very low  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to very high (1.42 to 99.90 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum content:* 2 percent  
*Maximum salinity:* Nonsaline (0.0 to 1.4 mmhos/cm)  
*Sodium adsorption ratio, maximum:* 1.0  
*Available water supply, 0 to 60 inches:* Low (about 4.6 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 2e  
*Hydrologic Soil Group:* A

## Custom Soil Resource Report

*Ecological site:* F144AY022MA - Dry Outwash

*Hydric soil rating:* No

### Description of Urban Land

#### Typical profile

*M - 0 to 10 inches:* cemented material

#### Properties and qualities

*Slope:* 0 to 8 percent

*Depth to restrictive feature:* 0 inches to manufactured layer

*Runoff class:* Very high

*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)

*Available water supply, 0 to 60 inches:* Very low (about 0.0 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 8

*Hydrologic Soil Group:* D

*Hydric soil rating:* Unranked

### Minor Components

#### Hinckley

*Percent of map unit:* 5 percent

*Landform:* Deltas, kames, eskers, outwash plains

*Landform position (two-dimensional):* Summit, shoulder, backslope

*Landform position (three-dimensional):* Nose slope, crest, head slope, side slope, rise

*Down-slope shape:* Convex

*Across-slope shape:* Convex, linear

*Hydric soil rating:* No

#### Sudbury

*Percent of map unit:* 5 percent

*Landform:* Deltas, terraces, outwash plains

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread, dip

*Down-slope shape:* Concave

*Across-slope shape:* Linear

*Hydric soil rating:* No

#### Windsor

*Percent of map unit:* 5 percent

*Landform:* Outwash terraces, dunes, outwash plains, deltas

*Landform position (three-dimensional):* Tread, riser

*Down-slope shape:* Linear, convex

*Across-slope shape:* Linear, convex

*Hydric soil rating:* No



## **Town of Arlington, Massachusetts**

---

### **Notice of Intent: 34 Dudley Street**

#### **Summary:**

Notice of Intent: 34 Dudley Street

*This application was first heard on March 3, 2022. The hearing was continued at the applicant's request. The commission requested the applicant to update documents related to photometrics, shading, erosion controls, and stormwater management. For the original application, please refer to the March 3, 2022 meeting materials; no additional materials were provided for the May 5, 2022 hearing.*

This public hearing will consider a Notice of Intent to construct a five-story self-storage facility at 34 Dudley Street and remove a failing retaining wall on the adjacent Town-owned parcel at 0 Grove Street. As proposed, the project will result in impacts within the Riverfront Area to Mill Brook, 100-foot Adjacent Upland Resource Area, and buffer zone to Bank.